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ABSTRACT

Selected and prepared by classroom teachers, these environmental education exercises were developed to be incorporated into specific subject matter areas, not to provide an additional course or unit. Activities in this teacher's guide for elementary grades 1-3 are directed toward art, science, special education, and those which may cover all subject matter areas. Each of the 34 exercises enumerates in outline form the title of the lesson, behavioral objectives, materials needed, major activities, follow-up activities, evaluation questions or objectives, and reference materials. Charts or diagrams are included where necessary to supplement the explanations. This work was prepared under an ESEA Title III contract. Related documents are SE 016 630 - SE 016 632. (BL)

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ENVIRONMENTAL EDUCATION EXERCISES

Bourbon County Schools
Environmental Education Department
Paris, Kentucky 40361

ELEMENTARY
1-3

SE 016 629

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TABLE OF CONTENTS

Page

ENVIRONMENTAL EDUCATION EXERCISES FOR ALL SUBJECT MATTER AREAS BY FRANCES FALKENSTINE

Exercise #1, Make Our Country Beautiful..... 4
Exercise #2, Building a Terrarium..... 5
Exercise #3, Our World of Sounds..... 6
Exercise #4, Air and Air Pollution..... 8

ART EXERCISE PLANS BY BETSY COX

Exercise #1, Color in Nature..... 18
Exercise #2, Color in Nature..... 18
Exercise #3, Trees: Color, Shape, Texture..... 19
Exercise #4, Summetry or Balance in Nature..... 20
Exercise #5, Don't Be a Litterbug!..... 21
Exercise #6, Conservation of Toys..... 21
Exercise #7, Mud Pies..... 22
Exercise #8, Nature Prints: Leaf Silhouettes..... 23
Exercise #9, Nature Prints: Sun Prints..... 24
Exercise #10, Nature Prints: Spatter Prints..... 24
Exercise #11, Nature Prints: Tempera Leaf Prints..... 25
Exercise #12, Nature Prints: Smoke Prints..... 26
Exercise #13, Nature Prints: Spider Web Print..... 27
Exercise #14, Nature Prints: Spore Prints..... 28
Exercise #15, Stamping Art..... 29
Exercise #16, Nature Prints: Opaque Design..... 29
Exercise #17, Weaving with Grasses and Seeds..... 30
Exercise #18, Sand Painting..... 31

SCIENCE EXERCISE PLANS BY VERLA CLIFFORD

Exercise #1, The Fall Season..... 34
Exercise #2, The Winter Season..... 35
Exercise #3, The Spring Season..... 37
Exercise #4, The Summer Season..... 38

SCIENCE EXERCISE PLANS BY RUTH EWALT

Exercise #1, Seed Dispersal..... 42
Exercise #2, Adopt a Tree..... 43
Exercise #3, Wildflowers..... 45
Exercise #4, Identification of Poison Ivy..... 47
Exercise #5, Animal Homes..... 48
Exercise #6, Bird Nests..... 50

SPECIAL EDUCATION EXERCISE PLANS BY SUE GILVIN

Exercise #1, Social Behavior: Anti-Littering Campaign..... 53
Exercise #2, Appreciation of Our Environment Through Our Senses..... 60

FOREWORD

The enclosed "Exercises" were selected and prepared by classroom teachers. They were developed to be incorporated into specific subject matter areas and not to provide an additional course or unit.

Many teachers have been teaching environmental topics and several of these are included. Programs from around the country were reviewed and selections made from these that were applicable to our situation.

Several "Exercises" were intended to be used in the out-of-doors. Many school grounds have a variety of plants and animals which can be used for outdoor studies.

BOURBON COUNTY SCHOOLS
ENVIRONMENTAL EDUCATION DEPARTMENT
HAROLD GROOMS, COORDINATOR
PARIS, KENTUCKY 40361

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TITLE III, ESEA
REGION IV-B
400 LAFAYETTE PARKWAY
LEXINGTON, KENTUCKY 40503

ENVIRONMENTAL EDUCATION EXERCISES FOR ALL SUBJECT MATTER AREAS

Incorporating Environmental Studies

ELEMENTARY SCHOOL LEVEL

Sources Consulted in Developing:

Childcraft, 1971 Edition, Volume 3 & Volume 4
Field Enterprises Educational Corporation
Chicago, Illinois

Child Life Magazine, May, 1972
1100 Waterway Boulevard
Indianapolis, Indiana, 46202

Scholastic's Earth Corp's First Follow Nature
Environmental Awareness, Book 2, SW 22

Children's Playmate Magazine, Aug./Sept., 1972
1100 Waterway Boulevard
Indianapolis, Indiana, 46202

The How and Why Wonder Book of Ecology, Copyright 1971
Shelly and Mary Louise Grossman
Grosset and Dunlap
New York, New York

Ranger Rick's Nature Magazine, March, 1972

People and Their Environment
J. G. Ferguson Publishing Company
Chicago, Illinois

A Curriculum Guide for Nature Study in the Elementary School
Marilyn Greulach
Abington School District
Abington, Pennsylvania

Compiled by:

Mrs. Frances Falkenstine
Center Hill Elementary School
Bourbon County Schools
Paris, Kentucky 40361

EXERCISE #1

Title of Lesson: Make Our Country Beautiful

Purpose:

1) To develop self respect and respect for the rights of others
2) To develop respect for property regardless of ownership
3) To develop an awareness that all must help to keep our environment clean and free from trash

Behavioral Objectives:

1) Children collect litter and trash and deposit in proper containers
2) Children take pride in helping improve appearance of home, school and community

Materials Needed:

1) Large brown paper bag
2) Construction paper and glue
3) Pipe cleaners for handles
4) Paints and brushes or crayons
5) Drawing paper

Activities:

1) Discuss with children the meaning of litter (anything out of its proper place).
2) Make a list of words on chalkboard as children name things that are litter such as paper, empty plastic bottles, tin cans, old shoes, etc.
3) After the list is made, the teacher may ask, "What can we do to keep from becoming litterbugs?": a) use trash receptacles for trash and remind others to do so, b) keep desks clean, c) keep litterbag in family car and use it; never throw litter out of car window, d) pick up clothers and toys at home.
4) Each child makes a litterbag from a paper bag. Take home to use in family car.
5) Take class on a tour of school building and grounds. Look for trash to pick up and place in trash receptacles. The teacher might propose a contest between boys and girls: all trash to be placed in trash receptacles after the contest. After the tour, discuss with the children why litter should not be left on school grounds or home grounds.

Follow-up Activities:

1) Make litterbug signs and place in halls or lunchroom of school as a reminder to others.
2) Encourage children throughout year to take pride in school grounds and to pick up litter and trash.
3) Make up songs or jingles with the children about litterbugs: to the tune of a familiar song.

Evaluation:

1) Children growing in responsibility: learning from each other as they work together.
2) Children developing an awareness that all must work together to keep our environment neat and free from trash.

3) Children voluntarily collect trash without "being told to do it".

Reference Materials:

1) Just Like Me, Bauer, William
2) "Lassie's Litter Bit", film, 28 min., Modern Talking Pictures
3) People and Their Environment, Teacher's Curriculum Guide to Conservation Education, J. G. Ferguson Publishing Company, Chicago, Illinois
4) A Curriculum Guide for Nature Study in the Elementary School, by Greulach, Marilyn, Abington School District, Abington, Pennsylvania

School Library Reference Materials:

1) Free material from Caterpillar Tractor Company, Dept. AB2C, 100 N.E. Adams Street, Peoria, Illinois
2) Free material from Standard Oil Company of California, Public Relations Department, 225 Bush Street, San Francisco, California

EXERCISE #2

Title of Lesson: Building a Terrarium

Behavioral Objectives:

1) Children will experience setting up and observing a terrarium
2) Children will understand the relationships of plants and animals in an environment

Materials Needed:

1) Small aquarium tank or a wide-mouth gallon jar
2) Gravel and sand
3) Charcoal
4) Woods soil containing humus
5) Small plants and tree seedlings, including soil to protect the roots (mosses, ferns, violets, partridge berry or creeping snowberry are good plants to use. These may be kept in plastic bags containing a little moisture until ready for use.)
6) An interesting rock(s)
7) A small saucer for water
8) A small piece of log to place near the water
9) A pane of glass to cover the terrarium. If glass is not available, a plastic wrap secured by a large rubber band could be used.
10) Animals brought to school by the children after the terrarium has been assembled. Suggest they look for snails, praying mantis, grasshoppers, spadefoot toad, lizards, beetles, caterpillars, etc.

Activities:

1) Place the gravel at the bottom of the container first (1 inch). Then pour the sand over the gravel (1 inch). Excess water will be stored here.
2) Charcoal comes next. This will absorb gases and help keep the soil from becoming sour.

3) Then add soil from the woods: 3 or 4 inches deep over the charcoal, sand and gravel. Plant the small plants without overcrowding.
4) Cover the remaining soil with moss.
5) Place a small dish to hold water into the soil and moss. Put water into the dish and spinkle plants with water. Explain to children that the dish of water is like a little pond. Place interesting rocks and small pieces of log into position.
6) Cover the container with glass or plastic cover.
7) The teacher explains to the children that a world has been created where the plants and animals can live together. It is called a "terrarium". "Tomorrow, we will place our animals in our little world." Look around the room and find the best place for the terrarium. The plants lived in the woods and should have about the same amount of sunlight as they got there. Place where children can observe it closely.

Follow-up Activities:

1) Watch the terrarium each day: a) growth of plants, b) the "rain" in the terrarium, c) the animals eating the small bits of food placed inside for them each day, d) the leaves and berries of the green plants, e) the fact that it is not necessary to add water.
2) Show filmstrip, "Finding Out How Plants Grow", available at the Bourbon County Schools Materials Center.
3) Show film, "We Explore the Field and Meadow", b/w, 11 min., Coronet Films, 65 East South Water Street, Chicago, Illinois.

Evaluation:

After the exercise has been completed, children should have a better understanding of the relationships of plants and animals in an environment.

Reference Materials:

1) "We Explore the Field and Meadow", film
2) "Finding Out How Plants Grow", filmstrip
3) People and Their Environment, Teacher's Curriculum Guide to Conservation Education, Brennan, Matthew J.; J. G. Ferguson Publishing Company, Chicago, Illinois

School Library Reference Materials:

Our Terrarium, Wong, H. H. and Vessel, M. F.; Addison-Wesley Publishing Company, '69, 31p. illus. by Aldren A. Watson

EXERCISE #3

Title of Lesson: Our World of Sounds

Purpose:

Sound is an important factor in interpretation of our environment. Frequently, taken for granted, sound is responsible for the pleasure we take in music, most of our communications and even some of our annoyances.

EXERCISE #3 (cont.)

Behavioral Objectives:

1) Children will be more aware of sounds
2) They will know more about how sounds are made and transmitted through various materials
3) They will have an increased appreciation of some good music

Materials Needed:

1) Recording of good music
2) Record player or tape recorder
3) Recording of "Songs of Birds"
4) Paints and brushes
5) Crayons
6) Drawing paper

Activities:

1) Ask children to put their heads on their desks, close their eyes and listen carefully. Then identify the sounds heard. Discuss ways in which sounds differ. Use terms, "loud, soft, high, low, squeaky, harsh", etc.
2) Let children give examples of unpleasant sounds (slammed door, window banging, chair falling, etc.).
3) Ask children for examples of a pleasant nature.
4) Play a recording of soft, beautiful music. Ask the children to close their eyes as they listen. Ask: a) How does the music make you feel?, b) What do you think about as you listen? After the recording, let the children tell what their thoughts were.
5) Give to each child a coloring sheet and ask each child to express his feelings by coloring on the paper. After the pictures are finished, display them on wall, bulletin boards, etc.

Follow-up Activities:

1) Ask the children to tell about the many sounds they hear around them. List on the chalkboard under the following groupings: a) sounds we like to hear: birds singing, pleasant voices, rain splashing, soft music, b) sounds we do not like to hear: shouting, crying, automobile brakes screeching, etc., c) sounds that help us: horns blowing, fire alarm, telephone ringing, d) for music appreciation period, play "Grand Canyon Suite". Using these lists, make charts, bulletin board displays or booklets. Use cut-out pictures of children's drawings to illustrate them.
2) Play recordings of bird calls ("Bird Songs in Your Garden" and "Songbirds of America").
3) Show film, "Birds of the Forest".
4) Play record, "Grand Canyon Suite".

Evaluation:

Children are more aware of sounds and how sounds are made and transmitted. Children enjoy listening to good music.

EXERCISE #3 (cont.)

Reference Materials:

1) "Birds of the Forest", film
2) "Bird Songs in Your Garden", record
3) "Songbirds of America", record

EXERCISE #4

Title of Lesson: Air and Air Pollution

Behavioral Objectives: After the completion of this lesson, the pupils should be able to:

1) Identify 3 major sources of air pollution
2) Name 3 ways to help prevent air pollution
3) Understand that clean air is necessary for life

Materials Needed:

1) Candle and holder
2) Foot long piece of rubber tubing
3) Funnel
4) Matches
5) Milk bottle or large jar
6) Microscope
7) Water

Activities:

DEW 1) Where does dew come from? Early in the morning, dew drops sparkle like jewels on a leaf. They glisten on a spiderweb and glitter on blades of grass. But last night, the dew drops weren't there. Last night, the leaves were dry, the grass was dry and the spiderweb was dry.

2) What makes the dew? Dew is formed only when the air is damp and when the air is warmer than the ground. Then the dampness of air sticks on the leaves, the grass and spiderweb. The tiny bits of water join each other and grow into little drops. The little drops join and grow into big drops. Then you see dew drops sparkling on the leaves, glistening on a spiderweb and glittering on the grass.

3) Make your own dew drops. You can make dew. You can make it with your breath. Your breath is warm and damp like the morning air. When a window pane is cold, blow gently on it. Blow some more. Little drops will come. Now you have made dew! (Childcraft, Vol. 3, 1971 edition, pp. 66, 67.)

DUST 4) What is dust? Dust is more than bits of grit and tiny specks of dirt. Dust can be bits of bats' wings, butterflies' tongues, flies' wings and dried up pieces of caterpillar skin. Dust can be tiny chips worn off a rock by rain and wind, a bit of whisker left by a mouse or a speck of soot from a far away chimney. Dust can be dandelion fluff or powdered rose pedals. It can be ground-up bird feathers or nutshell crumbs dropped by a squirrel.

5) If you look at dust through a microscope, you will see that dust is a mixture of all these things and many more.

6) Dust drifts in the air until a breeze sprinkles it on a window sill or swirls it into balls of fluff under the bed. (Childcraft, Vol. 3, 1971 edition, p. 62.)

FOG and SMOG

7) What sort of day can it be when you hear the footsteps of an invisible man and the bark of an invisible dog? What kind of a day is it when you can feel an itch at the end of your nose, but can't see the finger you use to scratch it? It is a foggy day: a day when the cold ground chills a warm, damp breeze and turns the dampness into tiny droplets of water. As the many tiny droplets come together, they form wisps of cloud. And as more and more dampness turns to more and more water droplets, the wisps of cloud get thicker and thicker until they cover the ground. And that's what a fog really is—just a cloud that covers the ground.

8) Take the SM from the word SMOKE and the OG from the word FOG. Put them together and you have SMOG. And that's what smog really is just mixed up smoke and fog. (Childcraft, Vol. 3, 1971 edition, p. 60.)

AIR OXY-GEN and FIRE

9) Probably, you realize that air is very important to you. Without it, you could not exist. Every day we swim in an ocean of air. Air is all around us. Since it is important to our very survival, let's investigate air a little more with the following experiment:
You will need a dish of water, funnel, candle and holder, a foot long piece of rubber tubing, milk bottle or large jar and matches. Directions: Place the candle in the holder. Put both objects in water. Light the candle and place the bottle (jar) over the top of the candle. After you have placed the milk bottle (jar) over the top of the candle, you will notice that the candle continues to burn for a little while. But soon, the flame will get lower and lower until it finally goes out. While the candle was burning, it combined with an important ingredient of air: oxygen. When the oxygen supply in the bottle ran low, the candle went out. Now, light the candle once again, but this time place a metal funnel over it instead of the milk bottle (jar). Do you think the candle will continue to burn because the funnel has a hole in the top? It won't. It will get out. Why? Hot gases are formed when the oxygen inside the funnel combines with the materials from the candle to form a flame. These gases go out the opening of the funnel. While the gases are going out, very little "new" air can get inside the funnel. So, if we want the candle to continue burning, we have to bring in "new" air from another direction. One way to do this is by attaching the rubber tubing to the inside of the funnel with tape. Be sure the end of the rubber tubing inside the funnel will be above the water level in the dish after you have placed the funnel back over the candle. Light the candle and place funnel over the top. This time, air will flow through the tube and supply the necessary oxygen to the candle so it won't go out. Do not allow any water to get into the tube or it will block the flow of air and the candle will go out. This principal is very much like that of your furnace. There is an opening for air at the bottom and a chimney at the top for the gases to escape. (Child Life Magazine, May 1972, p. 17.)

10) Summary: Much of our air pollution comes from furnaces that are not properly adjusted. If your gas furnace burns with a clear, blue flame, there is less air pollution.

11) In cities, men are working to help keep the air clean. They show factory owners and workers how to keep their factories from pouring dirt and smoke into the air.

12) In the country, we need to watch the burning of trash and garbage. Many places are using landfills where garbage and trash is covered over with dirt. The good gardener makes a compost pile of leaves, garbage and dirt. This can be used as a fertilizer later.

GREEN FACTORIES (OXYGEN)

13) Divers carry oxygen with them when they go into the water. Astronauts carry oxygen with them when they go into outer space. Why? Oxygen is a gas in the air we breathe. When men travel to airless places, they must take oxygen with them. Men cannot live without oxygen. Every minute of the day and night, people and plants and animals take oxygen out of the air. Yet, there is always more oxygen in the air. How can this be? The answer is that green plants are oxygen factories. Every tree, bush and blade of grass makes oxygen and puts it into the air. Ocean plants put oxygen into the air, too. Billions and billions of tiny, green plants float in the ocean. The plants are too small to see without a microscope. Yet, these tiny plants make most of the oxygen used by all of the living things in the world. You can see how green plants make oxygen. Put an aquarium plant into a jar filled with water. Put a glass funnel over the plant, and put a test tube over the funnel. Set it in the sunlight. Oxygen bubbles will rise into the test tube. Plants can grow only where there is clean air and water. The oceans, lakes, forests and meadows of the earth must be kept clean so that plants may continue to grow. Then each green oxygen factory can go on putting into the air the oxygen we need to live. (Childcraft, Vol. 4, 1971 edition, pp. 248, 249.)

AIR QUESTIONS AND ACTIVITIES (Scholastic Earth Corps, First Follow Nature, Environmental Awareness, Book 2, SW 22)

How many electric appliances do you use every day? A list might be: electric toothbrush, clock, radio, T.V., dishwasher, toaster, refrigerator. Can you list others?

Where does the electricity come from? Electricity isn't magic and it doesn't grow on power lines. To create electrical energy, power plants burn great amounts of fuel. A loss of that fuel goes up in smoke and into the air. It pollutes the air. Polluted air isn't healthful. It has caused some statues to crumble, crops to wither and people and animals to get sick. What does a covering of smog do to a beautiful view? What happens to sunlight on a smoggy day? Power plants are not the only air pollution. Can you list others?

Anything that burns something can cause air pollution. Cars, trucks, buses, tractors, incinerators, factories, etc. Look out your window. Is the air in your environment clean? How do you know? Can you see things that may be causing air pollution? Could there be pollution in the air that you can't see? What?

PROJECT HELP'S CREED (from p. 38 of Ranger Rick's Nature Magazine, March, 1972)

1) We will not litter the land, the water, the air.
2) We will pick up other's litter.
3) We will use white paper only.
4) We will buy beverages in returnable bottles.
5) We will crush empty cans and boxes before throwing them away.
6) We will recycle articles if possible.
7) We will save newspapers for a paper drive.
8) We will not waste water, electricity, food, etc.

9) We will bike or bus or ride with someone if possible rather than use the car.
10) We will be kind to animals--feed the birds, care for the trees and plant young trees.
11) We will write to our congressmen urging them to support environmental programs.
12) We will encourage parents and others to use: a) low-lead or un-lead gasoline, b) low-phosphate detergents or pure soap, c) compost piles.
13) We will discourage smoking in others and not smoke ourselves.
14) We will encourage parents and others to keep the car and furnace in good repair.

ENVIRONMENTAL ACTION AND CONSERVATION ORGANIZATIONS

Conservation Foundation (The)
1250 Connecticut Avenue, N.W.
Washington, D. C., 20036

Friends of the Earth
30 East 42nd Street
New York, New York, 10017

League of Women Voters of the United States
1730 M Street, N.W.
Washington, D. C., 20036

National Audubon Society
1130 Fifth Avenue
New York, New York, 10028

Nature Conservancy (The)
1522 K Street, N.W.
Washington, D. C., 20005

National Recreation and Park Association
1700 Pennsylvania Avenue, N.W.
Washington, D. C., 20006

National Science for Youth Foundation
763 Silvermine Road
New Canaan, Connecticut, 06840

National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C., 20036

Sierra Club
1050 Mills Tower
San Francisco, California, 94104

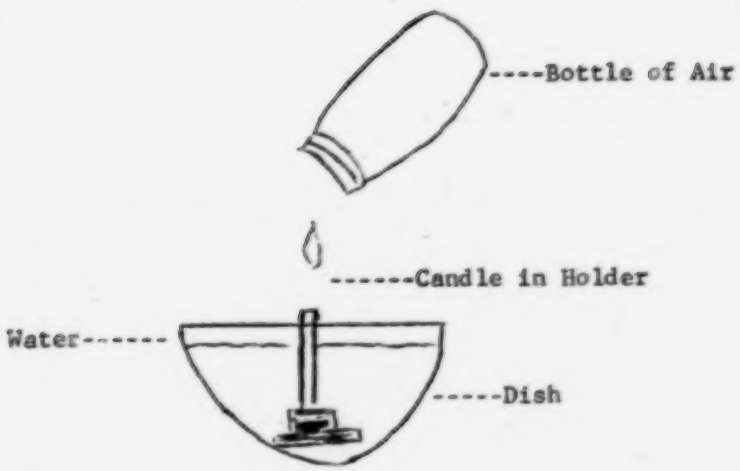
Izaak Walton League of America
1326 Waukegan Road
Glenview, Illinois, 60025

Evaluation:

1) Can the students name 3 major sources of air pollution?
2) Can the students name 3 ways to help prevent air pollution?
3) Do students understand that clean air is necessary for life?

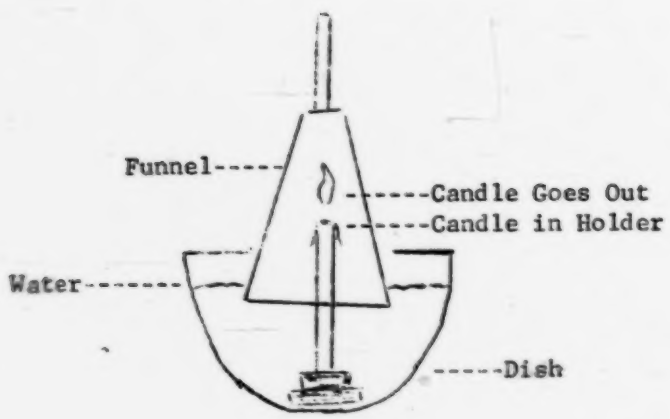
..EXERCISE #4..

DIAGRAM 1



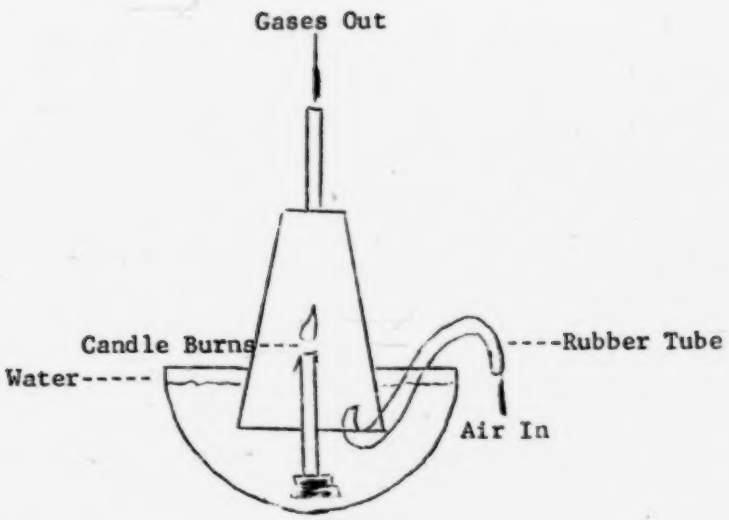
..EXERCISE #4..

DIAGRAM 2



..EXERCISE #4..

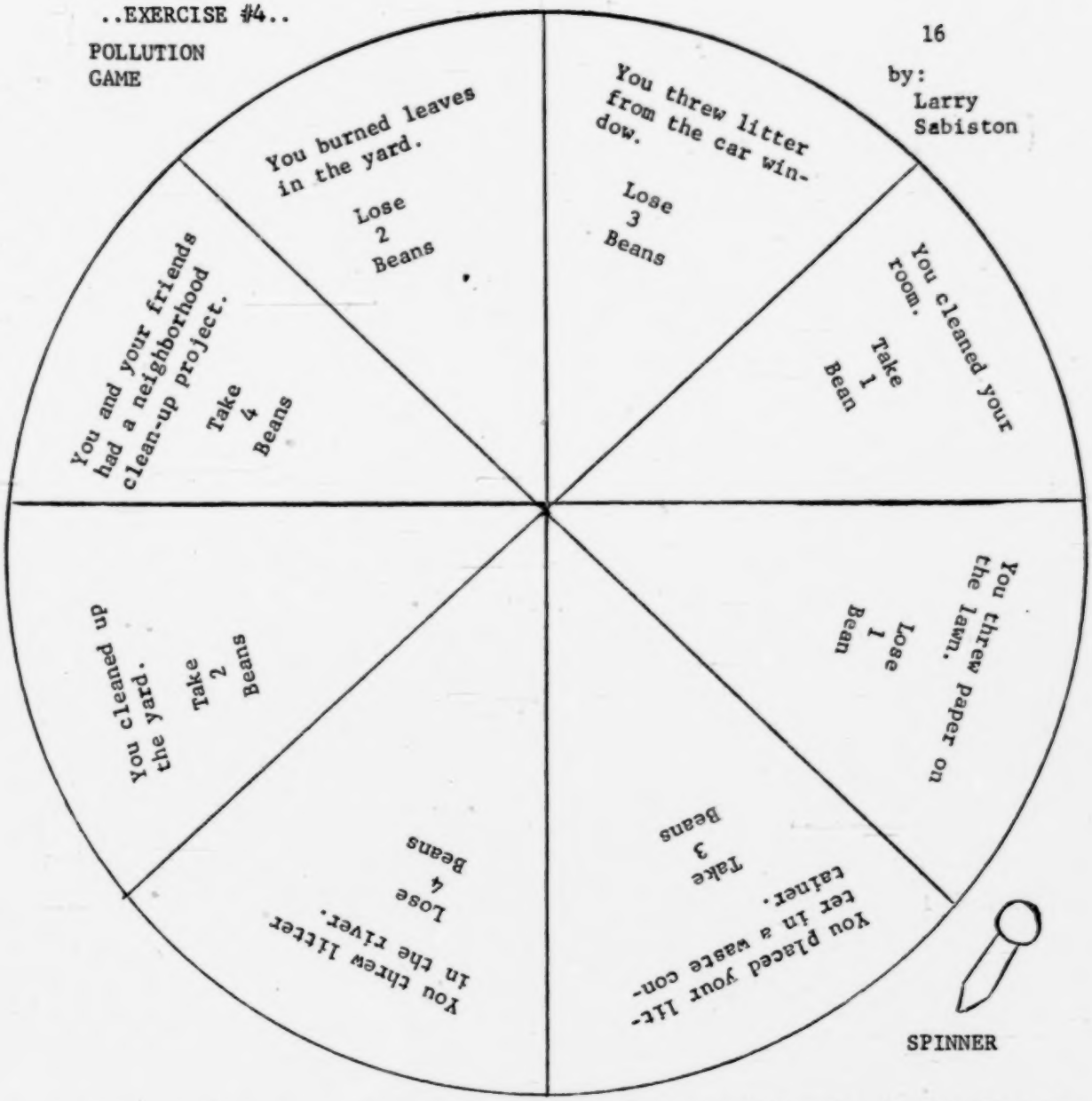
DIAGRAM 3



..EXERCISE #4..

POLLUTION GAME

by: Larry Sabiston


You burned leaves in the yard.
Lose 2 Beans
You threw litter from the car window.
Lose 3 Beans
You cleaned your room.
Take 1 Bean
You threw paper on the lawn.
Lose 1 Bean
You placed your litter in a waste container.
Take 3 Beans
You threw litter in the river.
Lose 4 Beans
You cleaned up the yard.
Take 2 Beans
You and your friends had a neighborhood clean-up project.
Take 4 Beans
SPINNER

Cut out the spinner and circle and paste them on cardboard. Attach the spinner to the center of the circle with a pin. You will need a bowl of beans. Each player takes 10 beans before the game starts. Taking turns, each player gets 10 spins. The beans that are won are taken from the bowl and added to each player's supply. The beans that are lost are returned to the bowl. The player who finishes with the most beans is the winner.

(p. 51, Children's Playmate Magazine, Aug./Sept., 1972)

ART EXERCISE PLANS

Incorporating Environmental Studies

ELEMENTARY SCHOOL LEVEL

Sources Consulted in Developing:

Environmental Education: Objectives and Field Activities
Paducah Public Schools
Paducah, Kentucky

Southeastern Pennsylvania Outdoor Education Center
Sycamore Mills Road
Media, Pennsylvania

Compiled by:

Mrs. Betsy Cox
Art Major
University of Kentucky

EXERCISE #1

Title of Lesson: Color In Nature

Objectives:

1) To enrich concepts of color
2) To discriminate the primary colors and understand that secondary colors are made from primary ones
3) Become aware of value differences by comparisons
4) Relate science concepts of light to art concepts

Materials Needed:

Instructor may want to take along a simple color wheel

Activities:

Following class preparation in light and color, take class on a field trip out of doors. Have students identify and describe as many colors as possible in nature. Encourage accurate descriptions with students using familiar references (chocolate brown, tobacco brown, apple red, etc.) This same trip might be made at other times when the seasons change. Guide students to an awareness of value changes by pointing out examples and letting them find others.

Follow-up Activities:

Display all wheels and discuss differences relating color concepts.

Evaluation:

1) Do students exhibit an appreciation for the colors in nature?
2) Do students use descriptions in identifying colors?
3) Are students better able to use color in their activities?
4) Did the students enjoy or appreciate the natural color and combinations of color?

EXERCISE #2

Title of Lesson: Color In Nature

Objectives:

1) To enrich concepts of color
2) To discriminate the primary colors and understand that secondary colors are made from primary ones
3) Become aware of value differences by comparisons
4) Relate science concepts of light to art concepts

Materials Needed:

1) Oaktag
2) 14" round cardboard or stiff paper
3) Natural materials to be found on the site or brought to the classroom by the students (rocks, twigs, metals, leaves, etc.)
4) Glue (white)
5) White paper
6) Construction paper

Activities:

Make a color wheel (14") using the objects collected for the points on the wheel, placing each as near as possible to its position on the wheel. Divide wheel and label according to diagram. Each student will be using different objects and will be able to express different values of each color. Make another wheel the size of the diagram and glue construction paper of appropriate colors at points indicated. This will serve as a guide for placing natural objects on oaktag wheel.

Follow-up Activities:

Display all wheels and discuss differences relating color concepts.

Evaluation:

1) Do students exhibit an appreciation for the colors in nature?
2) Do students use descriptions in identifying colors?
3) Are students better able to use color in their activities?
4) Did the students enjoy or appreciate the natural color and combinations of color?

Exercise #2 is to be used in conjunction with Exercise #1.

EXERICSE #3

Title of Lesson: Trees: Color, Shape, Texture

Objectives:

1) Children should be able to observe tree parts and note color, shape and texture
2) Children should understand the development of line from simple to complex (shape is derived from closure of line; size is derived from shape; repeat pattern is related to shape and size)
3) Children should be able to discriminate (visually) circles, squares, rectangles and triangles of various sizes in their environment

Materials Needed:

1) Plasticine clay
2) Ink or tempera paint
3) Sketching paper and pencils

Activities:

Prior to going on field trip, have each student sketch a tree (if this has not been done previously). Each child selects a tree to observe. Touch the bark. How does it feel? Describe it. Is it smooth? papery? rough? deeply grooved? What patterns can you see? What colors can you see in the bark? Describe the shape and color of the leaves. What shape is the tree? Are all the trees of the same shape? Are all the same in size (trees and leaves)? Can you find a rectangle? square? circle? triangle? Which are the biggest trees? the smallest? Can you find a texture in some natural object that you would like in cloth? Can you find a tree that looks like something else? Describe its shape. Give each

child enough plasticine clay for him to make a print of the bark texture. The clay prints should be placed each in a separate box for the return trip. While on the site, have each student sketch his tree.

Follow-up Activities:

1) Apply ink or tempera paint to mold and print onto construction paper. Each student can be encouraged to create his own designs with the print.
2) Display the sketches and prints.

Evaluation:

1) Does the student have a sense of shape and texture following this observation of the tree (compare sketches)?
2) Does the student recognize differences in size, shape, texture in his total environment?
3) Can the student recognize repeated patterns readily?
4) Can the student abstract what he sees?

EXERCISE #4

Title of Lesson: Symmetry or Balance in Nature

Objectives:

1) To become aware of the balance or symmetry that is found in leaves and throughout the environment
2) To recognize and describe man's use of symmetry in design
3) To recognize that natural patterns influence the patterns of art

Materials Needed:

1) Wax crayons
2) Onionskin paper
3) Leaves

Activities:

Observe a tulip tree leaf. Note equal or balanced portions of the leaf form (symmetry). Is the total shape symmetrical? Is the vein arrangement symmetrical? What examples of symmetry can students name (valentine heart shape, butterfly, birds, people, blades of grass, petals of a flower). Give each student a leaf. Lay paper over the leaf. Crayon over leaf to transfer shape and vein arrangement to paper. Do this same thing with non-symmetrical shapes. On trees having symmetrical leaves, are all the leaves exactly the same shape? Can you find lopsided leaves? From a distance, does the total outline of the tree look symmetrical? Standing underneath, are the branches evenly balanced?

Evaluation:

1) Do the children understand the concept of symmetry?
2) Do the children see nature as a good source of design?

EXERCISE #5

Title of Lesson: Don't Be a Litterbug!

Objectives:

1) Each student should be able to work with others
2) Each student should accept responsibility for his environment
3) Each student should develop respect for property

Materials Needed:

1) 1 large and 1 small brown bag for each student
2) Construction paper
3) Glue
4) Pipe cleaners
5) Crayons

Activities:

Prepare before the class a mask from large paper bag. After demonstrating the litterbug, turn mask over, attach pipe cleaner handles and demonstrate the use of the litter bag. Take the class on a tour of the school grounds filling litter bags as they go. Each student makes a litter bag out of the smaller bags, decorate them and attach pipe cleaner handles. These can be taken home and used in the family car.

Evaluation:

1) Did students work together to solve a part of the litter problem?
2) Did students enthusiastically accept their responsibility in curbing the litter problem?

Reference Materials:

1) Teacher's Curriculum Guide to Conservation Education
2) "Lassie's Litter Bit", film, color, 28 min., free
3) "Litterbug", film, Avis Films, P. O. Box 643, Burbank, California

EXERCISE #6

Title of Lesson: Conservation of Toys

Objectives:

1) To form good habits of wise use of materials
2) To use imagination in making toys from cast-off things
3) To realize the value of all resources

Materials Needed:

Discarded materials of all kinds: tin cans (with no sharp edges), boxes, string, spools, fabric scraps. Tools: scissors, hammer, etc. and glue

Activities:

Offer suggestions or let students invent ways to utilize discarded materials to make toys or gifts:

Boxes of all sizes: trains, cars, doll houses, doll furniture
Tin cans: telephones, stilts, drums, animals, charcoal starter
Oatmeal boxes: drums
Spools: animals, dolls, bubble blower, totem poles
Scraps of cloth: doll dresses, parachutes, bean bags, stuffed animals

Evaluation:

1) Are students more aware of the need to cooperate and use materials wisely?
2) Are students more concerned about the value of resources?
3) Are students able to use their imaginations in developing abstractions of materials?

Reference Materials:

1) Teacher's Curriculum Guide to Conservation Education
2) A Treasury of Elementary Teaching Ideas and Techniques
3) "Adventures in Art", Lannigan and Ordos (Heath), kit

EXERCISE #7

Title of Lesson: Mud Pies

Objectives:

1) To learn to enjoy natural resources
2) To enrich concepts in science of the natural resources
3) To discover the qualities of soils and effects of other resources upon soil

Materials Needed:

1) Old shirts (1 for each child) for "cover-ups"
2) 3 containers each filled with a different type of soil (sand, clay, humus)
3) Newspapers
4) Water
5) Big spoons and sand shovels (optional)

Activities:

It is best to work out of doors near a water supply for this activity. Make mud pies out of the 3 different types of soil. Then, by mixing types, decide which combination is best for making the best pies. The mud pies could be decorated with pebbles. Spread pies out on newspapers and put them in a sunny, windy place to dry.

Follow-up Activities:

1) What did we use to make mud pies (soil, water, rocks)?
2) Why did we put them in a sunny, windy place?
3) Name the natural resources that were used to make mud pies.
4) Name 7 natural resources and their uses.
5) Think of other ways resources can be used for fun.

Evaluation:

1) Did students enjoy this activity?
2) Did students discover the ideal properties of soils?
3) Did students successfully relate this activity to science concepts involved?

Reference Materials:

1) Things, Dunn, Phoebe, Tris; Doubleday, '68
2) "Lands and Waters of Our Earth", film, color, 11 min., Coronet Films, 65 East Southern Water Street, Chicago, Illinois
3) "Soil and Life (The)", United World Films, 221 Park Avenue South, New York, New York

EXERCISE #8

Title of Lesson: Nature Prints: Leaf Silhouettes

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Small piece of sponge
2) Ink pad
3) Leaf
4) Paper

Activities:

Press sponge on ink pad and thoroughly ink. Hold leaf on paper and rub sponge all around edge of leaf using outward motions onto paper. Remove leaf and there will be an outline of the leaf on the paper. This is an easy method to use when only the shape of the leaf is needed. Several of these prints can be made as an aid in identifying leaves.

Evaluation:

1) Were students able to identify differences in leaves by their shapes?
2) Do students understand the relationship of line, shape and pattern?

Reference Materials:

1) Nature as Disigner, Bager, Bertel; Scranton, Pennsylvania (International Textbook Company), '66
2) "Learning About Leaves", Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois

EXERCISE #9

Title of Lesson: Nature Prints: Sun Prints

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Colored construction paper
2) Leaves
3) Pins or small rocks

Activities:

Pin leaves to construction paper or hold down with small rocks and place in bright sunlight. Let leaves remain in sun for an hour or longer. Remove leaves and find outlines on the paper. This is a very simple lesson to show that light fades color and is a simple method to use when only the shape of the leaf is needed.

Evaluation:

1) Do students understand the relationship of light and color?
2) Were students able to identify differences in leaves by their shapes?
3) Do students understand the relationship of line, shape and pattern?

Reference Materials:

"Learning About Leaves", Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois

EXERCISE #10

Title of Lesson: Nature Prints: Spatter Prints

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Tempera paint, ink or shoe polish
2) Old toothbrushes
3) Small pieces of wire screen or small stick
4) Leaves
5) Pins or small rocks

Activities:

Pin leaf or leaves on paper or hold down with small rocks. Dip toothbrush in paint, ink or shoe polish and rub over screen until entire paper is covered with spatterings. If screen is not available, the same effect may be achieved by drawing a small stick or your finger along the bristles of the brush. (Motions of stick or finger should be toward you.) When desired amount of spattering is achieved, remove leaf to find leaf outline standing out in the midst of the spatter. This technique can also be done simply by using a can of spray paint.

Evaluation:

1) Were students able to identify differences in leaves by their shapes?
2) Do students understand the relationship of line, shape and pattern?

Reference Materials:

"Learning About Leaves", Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois

EXERCISE #11

Title of Lesson: Nature Prints: Tempera Leaf Prints

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Powdered tempera paint
2) Water
3) Container for mixing
4) Leaf
5) Paper
6) Brush (optional)

Activities:

Mix a small amount of powdered tempera paint with water and pour or brush mixture onto paper. Place leaf, vein side down, on paint. Put another piece of paper on top of the leaf and rub all parts thoroughly. Remove leaf and place, vein side down, on a fresh piece of paper on top of the leaf and rub. A colored leaf print will result. Different parts of the leaf may be pressed into different colored tempera to make prints of autumn leaves changing colors. Shoe polish can also be used successfully with this technique.

Evaluation:

1) Were students able to identify differences in leaves by their shapes?
2) Do students understand the relationship of line, shape, texture and pattern?

Reference Materials:

"Learning About Leaves", Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois

EXERCISE #12

Title of Lesson: Nature Prints: Smoke Prints

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Candle
2) Matches
3) Lard or other type of shortening
4) Typing paper
5) Leaf
6) Newspaper (optional)

Activities:

Take a sheet of typing paper and grease surface lightly with a little lard. Light candle and smoke-greased paper by moving it quickly back and forth over the flame. When the surface is black with soot, place soot side of paper up and put leaf, vein side down, on the blackened surface. Cover leaf with another piece of paper (newspaper would do for this or use another piece of typing paper) and rub until every part of the leaf is inked thoroughly with soot and grease. Lift leaf and place inked side down on a clean piece of typing paper. Cover with another piece of paper (any kind) and rub the entire leaf. Be very careful not to move the leaf as this will blur the print. When every part of the leaf has been carefully rubbed, remove and discard the top paper and leaf. This is one of the most primitive methods of printing and results in a delicate etching-like print.

Evaluation:

1) Are students understanding the different kinds of prints and how they might be an aid in learning?

2) Were students able to identify differences in leaves by their shape?
3) Do students understand the relationship of line, shape and pattern?

Reference Materials:

"Learning About Leaves", Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois

EXERCISE #13

Title of Lesson: Nature Prints: Spider Web Print

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Dark colored construction paper
2) White enamel spray paint
3) Scissors
4) Plastic spray or hair spray

Activities:

Locate a spider web and gently persuade spider to move off if there is one as you won't want to kill it. Check around the web to be sure there is nothing the paint would harm. Check the direction of the wind and spray (with the breeze) the web lightly with paint on both sides. When all parts of the web have been sprayed, ease paper close to the underside or back of the web being careful not to disturb the web. Try to touch paper to all parts of the web at once. As soon as the web is stuck to the paper, snip the lines at the edges of the paper very carefully capturing the web from its surroundings. There you will have the spider's work outlined on your sheet of paper. The wet paint will act as glue. Put the print on a flat surface to dry. When it is dry, you may want to preserve it by spraying the entire paper with plastic spray or hair spray.

Follow-up Activities:

Using string, have students construct a large spider web in class for a bulletin board background.

Evaluation:

1) Do the students have an understanding of the working of spiders?
2) Did students dispel some of their fears or dislikes of spiders and gain an appreciation of this creature?

Reference Materials:

Southeastern Pennsylvania Outdoor Education Center, "Spider Webs", Activity #23

EXERCISE #14

Title of Lesson: Nature Prints: Spore Prints

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Mushroom cap
2) Light colored paper
3) Gum arabic or glue
4) Glass or plastic dish

You may want to use the following materials instead:

1) Mushroom cap
2) Wax paper
3) Electric iron
4) Glass dish
5) Construction paper

Activities:

In this exercise, the fungus usually prints itself. To make the spore print, cut the mushroom from its stem, close to the gills. Coat hard surfaced sheets of paper with glue and place the mushroom cap, rounded side up, gill side down, upon the paper and cover with the glass dish. Let the mushroom stand for a while, overnight if possible, making sure not to move it while the spores are dropping onto the paper. If it is not disturbed, an exact print of the underside of the mushroom should occur. Spore prints may be made with wax paper if an electric iron is available. Use same directions as above: Place the mushroom cap on wax paper and cover with glass dish. After spore print has set, to make it permanent, heat wax paper with electric iron set on "low". Turn iron, warm flat side up, and place underside of wax paper on iron. The spores will settle into the melting wax. The print may then be mounted on colored construction paper for contrast.

Evaluation:

1) Do students have a better awareness of shape and texture?

2) What patterns are students able to recognize?

EXERICSE #15

Title of Lesson: Stamping Art

Objectives:

1) To enrich feelings for natural materials as a source of design
2) To enrich art concepts of shape, color and texture
3) To construct different kinds of nature prints for display or collection
4) To recognize various prints and objects in nature by the patterns created
5) To demonstrate an awareness of shape and texture in nature
6) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Natural materials: fruits and vegetables such as oranges, apples, peppers, cucumbers, celery, grapefruit, nuts, cabbage.
   Natural materials such as bark, twigs, mushrooms, leaves, etc.
2) Foam rubber (water soaked) coated with tempera paint or India Ink
3) Paper (rice is best; newsprint or construction paper)
4) Firm stamping surface

Activities:

Moisten surfaces of objects on water soaked foam pad coated with tempera paint or India Ink. Stamp on paper. Encourage creative designing and combining of materials. If using leaves, place another sheet over leaf and rub thoroughly to make imprint. Instead of placing leaf on pad, a roller may be inked and rolled over leaf before leaf is pressed onto paper.

Evaluation:

1) Do the students have the feeling they are designing something by themselves?
2) Do students understand the meaning of overlapping in relation to space and distance?
3) Did students experiment with color and patterns?

Reference Materials:

Forms and Patterns in Nature, Strache, Wolfe; New York; Pantheon, '56

EXERCISE #16

Title of Lesson: Nature Prints: Opaque Designs

Objectives:

1) To construct different kinds of nature prints for display or collection
2) To recognize various prints and objects in nature by the patterns created
3) To demonstrate an awareness of shape and texture in nature by the patterns created
4) To enrich the concepts of shape and texture by understanding the development of line from simple to complex (line=shape=size=pattern)

Materials Needed:

1) Wax paper
2) Facial tissue
3) Leaves of plants and flowers
4) Glue (clear-drying)
5) Iron

Activities:

Lay facial tissue over wax paper and place leaves and flowers with stems removed on facial tissue. Pour generous portion of glue over leaves and facial tissue. Place another sheet of wax paper over glue and gently press it down until all of the wax paper is touching glue. Allow to dry 24 hours or until clear. Place on hard surface and set iron on "medium". Press and lift up and down until surface is smooth. A banner can be made by using white 12"x18" construction paper in place of first wax paper. Braid yarn to finish top. Punch holes 1/2" apart at bottom. Cut 4" pieces of yarn. Fold and thread loop through hole and bring ends through loop to make fringe. Make a leaf mat: glue tissue paper 12"x18" to construction paper of same size. Arrange leaves on top of tissue paper. Pour glass on entire surface. Place wax paper over design. Press with fingers until glue is covering all the leaves and flowers. Press lifting up and down with iron set at "medium". Dry 24 hours. Peel wax paper off. Spray with clear lacquer.

Evaluation:

1) Were students creative in laying out designs?
2) Do students understand how collecting a variety of materials can be an aid in learning?

EXERCISE #17

Title of Lesson: Weaving with Grasses and Seeds

Objectives:

1) To enrich concepts of texture and pattern
2) To create understanding of variety of uses and qualities of materials

Materials Needed:

Cut and dried grasses and seeds

Activities:

Weave materials in various designs, experimenting to discover possibilities. These may be left as mats or shaped into baskets, bowls, pots and other ideas students may develop.

Evaluation:

1) Do students understand the variety of uses of materials?
2) Have students discovered the qualities of materials?

EXERCISE #18

Title of Lesson: Sand Painting

Objectives:

To enrich concepts of line, texture and pattern

Materials Needed:

Sandy soil area or school ground's sand box (each student should have an area of 12"-20" square)

Activities:

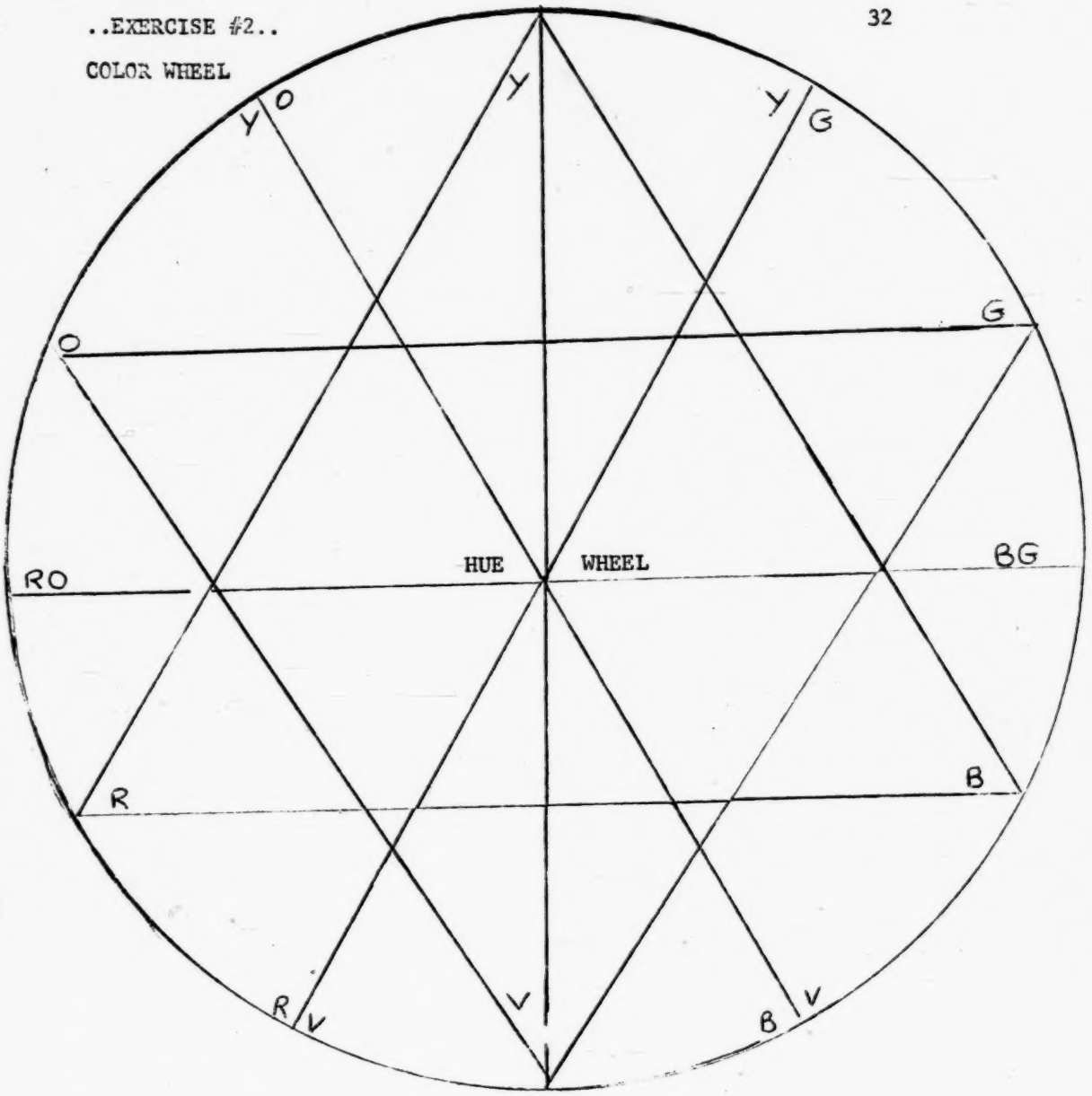
Design in the sand using fingers or twigs as drawing tools. Many creative designs may come of this activity. This can be combined with a photography experiment. As students complete their designs, photograph them. These may be suitable for enlarging and framing.

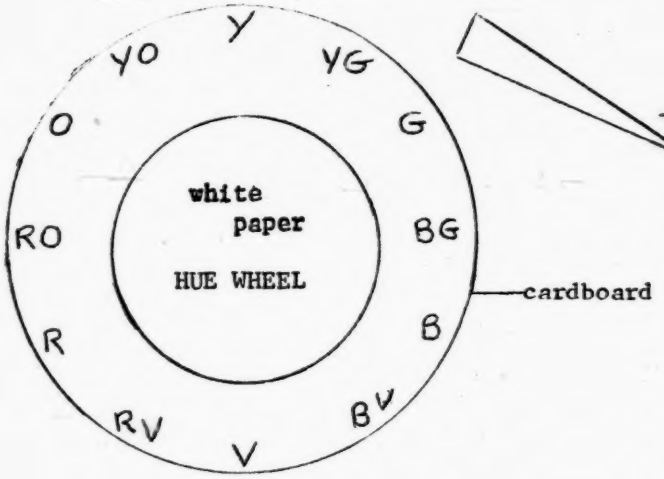
Evaluation:

1) Do students use line well in developing patterns?
2) Are students creative in designing in sand?
3) Do students see analogies between line and texture in nature and in paintings?

..EXERCISE #2..

COLOR WHEEL





Cut from construction paper and glue on wheel in correct position. Select colors as near as possible to points labeled.

Mark cardboard wheel same as paper one. Glue paper wheel onto cardboard. Students can use center as guide for natural materials.

SCIENCE EXERCISE PLANS

Incorporating Environmental Studies

ELEMENTARY SCHOOL LEVEL

Sources Consulted in Developing:

Observing Our Environment Through Our Senses
Bourbon County Schools Materials Center
Bourbon County Schools
Paris, Kentucky 40361

Compiled by:

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The following exercises are designed to teach the differences in the seasons through use of the 5 senses. The exercises on fall, winter and spring may be taught during the regular school year. The exercise on summer would have to be done during summer school.

EXERCISE #1

Title of Lesson: The Fall Season

Behavioral Objectives: After completing this exercise, the students will be able to:

1) List 8 birds, animals and insects which they have seen
2) Describe 6 sounds heard during the fall season
3) Describe the taste of 3 berries, nuts and wild fruits which pertain to the season
4) Describe 4 odors of the season
5) Compare the texture of leaves, plants, tree bark and soil

Materials Needed:

1) Tape recorder
2) Crayons
3) Scissors
4) Paste
5) Paper
6) Pencils
7) Old magazines
8) Charts

Activities:

1) A field trip will be taken to a wooded area where students will: SEE birds, animals, insects, plants and trees; HEAR sounds made by birds, animals, insects and the wind; FEEL bark and leaves of trees, plants, rocks and the wind; SMELL fresh wind, trash, tree leaves, bark, soil, water, wild flowers.
2) The tape recorder will be used to record sounds heard during the trip.
3) At school, the students will TASTE wild grapes, hickory nuts, walnuts, papaws, persimmons and describe the taste of each.
4) The students will collect pine cones, acorns, buckeyes and sumac for the science table.
5) Charts will be made describing the field trip.
6) A mural will be made by the students. It will be divided into 5 sections with each section containing pictures of the fall season which pertain to one of the 5 senses. Students may make their own pictures or cut them from old magazines.
7) In music and/or physical education, the students will sing and play the game, "Way Down Yonder in the Papaw Patch".
8) In art, the students will use the pine cones, acorns and buckeyes to make animal figures.

Follow-up Activities:

1) A tasting party will be held for the mother using the wild fruits, berries and nuts.
2) Blindfolded, the students will feel some of the things they have collected and identify them.

3) Also blindfolded, the students will identify items by smell.
4) The tape recorder will be played and students will identify sounds.

Evaluation:

After this exercise, students:
1) Listed 8 birds, animals and insects which they had seen.
2) Described 6 sounds heard during the fall season.
3) Described the taste of 3 berries, nuts and wild fruits that pertain to the season.
4) Described 4 odors of the season.
5) Compared the texture of leaves, plants, tree bark and soil.

Reference Materials:

1) Observing Our Environment Through Our Senses, available at the Bourbon County Schools Materials Center
2) "Autumn is an Adventure", film, Coronet Films
3) "Children in Autumn", film, Encyclopedia Britannica Films
4) "Fall Adventures", filmstrip, Society for Visual Education
5) "When Autumn Comes", filmstrip, Society for Visual Education

EXERCISE #2

Title of Lesson: The Winter Season

Behavioral Objectives: After completing this exercise, the students will be able to:

1) List 8 things they have seen during the winter season
2) Tell 6 sounds heard during the season
3) Describe the taste of 3 foods or drinks connected with the season
4) Describe 3 odors of the season
5) Describe the differences in the feel of deciduous and evergreen trees and the differences in the feel of animals' fur in the winter season

Materials Needed:

1) Bird feeders and feed
2) Bird chart
3) Yardstick and ruler
4) Thermometer
5) Paper
6) Pencils
7) Construction paper
8) Crayons
9) Scissors
10) Books on birds and animals

Activities:

1) A bird feeder will be placed outside the classroom window. SEE: the students will observe the different kinds of birds which come to the feeder, noting the difference in coloring and size and the different shapes in the beaks and feet. They will identify the birds on a bird chart in the classroom and make a list of what birds they have

seen. HEAR: the students will listen to the sounds of the birds and tell how they differ. TOUCH AND SMELL: the students will feel and smell different types of bird feed and describe the differences.

2) Bird books will be examined to learn which birds fly south for the winter and which do not.
3) A field trip will be taken to observe the difference between deciduous and evergreen trees. SEE: the students will describe the differences in the shape and color of the trees. TOUCH: the students will compare the differences in the bark of the deciduous and evergreen trees. They will compare the leaves of the evergreens to the leaves on the deciduous trees in the summer. SMELL: the students will describe the odor of the trees and compare them.
4) Animal books will be studied to see which animals hibernate and which do not. Students will compare the feel of the fur of animals now to that of the summer season.
5) The children will observe the snow in relation to the 5 senses. SEE: Is the snow the same color all over?, Does the color change with location?, Is there a difference in the color of the surface snow and that an inch from the surface?, Where did the dirt on the surface of the snow come from?, How did it get into the air?, Is it good or bad when dirt is in the air?, Is the snow you see from more than one snowfall? Cross section the snow and observe the layers of each snowfall., Where is the snow the deepest (measure). What causes the difference? HEAR: Listen to the quietness of a snowfall. Observe how quietly it falls to the ground. Listen to the sound of the wind before a snowstorm. Listen to the sound of sleet against the windowpane. TOUCH: Feel the snow and ice. Observe the difference. Note the feel of melting snow (measure the temperature of the melting snow and that which is not melting and observe the difference). TASTE: Taste some of the clean snow and icicles.

Follow-up Activities:

1) The students will prepare and eat foods which pertain to the winter season. Some of these might be popcorn balls, hot chocolate and Christmas candy.
2) Bulletin boards will be made with the winter season as the theme.
3) The students will collect natural food for the bird feeders.
4) The students will make an alphabet book using pictures of the winter season.

Evaluation:

1) Each student listed 8 things he had seen during the winter season.
2) Told 6 sounds heard during the season.
3) Described the taste of 3 foods or drinks connected with the season.
4) Described 3 odors of the season.
5) Described the difference in the feel of deciduous and evergreen trees and the difference in the feel of animals' fur in the winter season.

Reference Materials:

1) Observing Our Environment Through Our Senses, available at the Bourbon County Schools Materials Center
2) "Children in Winter", film, Encyclopedia Britannica Films
3) "How Animals Live in Winter", film, Coronet Films
4) "Birds Get Ready for Winter", filmstrip, Jam Handy Organization

5) "Getting Ready for Winter", filmstrip, Society for Visual Education
6) "Winter Adventures", filmstrip, Society for Visual Education

EXERCISE #3

Title of Lesson: The Spring Season

Behavioral Objectives: After completing this exercise, the student will be able to:

1) List 8 things he has seen during this season
2) Tell 6 sounds heard in the spring
3) Describe the taste of 5 fresh fruits or garden vegetables and products
4) Describe 4 odors of the season
5) Describe the feel of the sun, raindrops, going barefoot through the grass

Materials Needed:

1) Thermometer
2) Seeds
3) Garden equipment
4) Paper
5) Paste
6) Crayons
7) Construction paper

Activities:

1) A field trip will be taken over the community where the students' attention will be called to things they: SEE: the growing grass; flowers; trees and gardens; farmers plowing and planting their fields; baby animals. HEAR: the song of the birds; the sounds of insects; the voices of farmers at work; the sound of farm machinery; the sounds of animals. SMELL: freshly, plowed ground; flowers and flowering trees; burning tobacco beds. FEEL: warmth of the sun; gentle, spring breeze; feel of lightweight clothing.
2) At school, the students will: SEE: changing shadows on the playground; changes in the thermometer outside the window; rain beating against the windowpane; growing things on the playground. HEAR: voices of children at play out of doors; sound of rain against the windowpane. SMELL: flowers and newly cut grass; burning trash. FEEL: rain against the skin during a spring shower; grass against bare feet on the playground. TASTE: fresh strawberries and blueberries; fresh garden vegetables.
3) The students will plant a spring flower garden, making observations through each of the senses during planting and also when the seeds are coming up out of the ground.
4) A record will be kept of the temperature outside the classroom window.

Follow-up Activities:

1) In art, the students will make "leaf pictures" by pasting a leaf on paper and adding other details with crayons to make figures of ani-

mals or people.

2) The students will make a spring booklet. On each page will be the following poem:
"Spring is here, spring is here.
How do you think I know?
I saw a little _____,
And I know it must be so!"
The blanks will be filled with things the children have seen: robin, pussywillow, jonquil, etc. They will also make pictures for the booklet of the things they have seen.
3) Flowers from the garden the children planted will be used as Mother's Day gifts.

Evaluation:

Each student:
1) Listed 8 things he had seen during the spring season.
2) Told 6 sounds heard.
3) Described the taste of 5 products from the garden or fresh fruits.
4) Described 4 odors of the season.
5) Described the feel of the sun, raindrops, going barefoot through the grass.

Reference Materials:

1) Observing Our Environment Through Our Senses, available at the Bourbon County Schools Materials Center
2) "Children in Spring", film, Encyclopedia Britannica Films
3) "Spring Brings Changes", film, Churchill Films
4) "Spring is an Adventure", Coronet Films
5) "Birds in Spring", filmstrip, Jam Handy Organization
6) "Insects in Spring", filmstrip, Jam Handy Organization
7) "Plants in Spring", filmstrip, Jam Handy Organization
8) "Spring Adventures", filmstrip, Society for Visual Education

EXERCISE #4

Title of Lesson: The Summer Season

Behavioral Objectives: After completing this exercise, the student will be able to:

1) List 8 things he has seen during the summer season
2) Tell 6 sounds heard during this season
3) Describe the taste of 4 foods or drinks of the season
4) Describe 4 odors of the season
5) Describe the feel of water against the skin while swimming, the feel of the warm sun, cool breezes, etc.

Materials Needed:

1) Charts
2) Paper
3) Pencils
4) Crayons
5) Ice cream freezer

Activities:

1) The students will take a trip to the swimming pool at the YMCA where they will: SEE: the different colors of bathing suits; the splashing of water in the pool. HEAR: the voices of the children; the splashing of the water. SMELL: the odor of the water. FEEL: the water against their skin; the warmth of the sun.
2) The students will attend a baseball game where they will: SEE: the activities involved in the game; the excitement of the spectators. HEAR: voices of the spectators; sounds on the playing field. SMELL: foods at concession stand (popcorn, hotdogs, etc.). FEEL: jostling of the crowd; warmth of the sun; hardness of seats. TASTE: hotdogs, popcorn, softdrinks from concession stand.
3) The students will attend an outdoor band concert. They will: SEE: different kinds of band instruments. HEAR: the sounds of various instruments; differences in rhythm of songs.
4) The students will have a Fourth of July party where they will: SEE: the brightness of the fireworks display. HEAR: the sound of the fireworks; the cooking of hamburgers on an outdoor grill; the excitement of children. SMELL: the fireworks when they are lit; the cooking of food on the outdoor grill; burning charcoal. TASTE: charcoal-cooked hamburgers; sweet corn; lemonade; watermelon; ice cream. FEEL: warmth of charcoal fire; breeze from the wind; ice in the lemonade.

Follow-up Activities:

1) The students will make charts describing each activity.
2) The students will draw pictures and/or write stories of the activity they liked best.
3) The students will make their own ice cream for an ice cream party.

Evaluation:

After this exercise, each student:
1) Listed 8 things he had seen during the summer season.
2) Told 6 sounds heard during the season.
3) Described the taste of 4 foods or drinks of the season.
4) Described 4 odors of the season.
5) Described the feel of water against the skin while swimming, feel of the warm sun, cool breezes, etc.

Reference Materials:

1) Observing Our Environment Through Our Senses, available at the Bourbon County Schools Materials Center
2) "Children in Summer", film, Encyclopedia Britannica Films
3) "Summer is an Adventure", film, Coronet Films
4) "Summer Adventures", filmstrip, Society for Visual Education

The following School Library Reference Materials can be used as reference materials for the preceding 4 Exercises:

1) Sing a Song of Seasons, Brewton, Sara; Macmillan, '55, 200p. illus. by Vera Bock
2) Poems for Seasons and Celebrations, Cole, William; World, '61, 191p. illus. by Johannes Troyer

3) What is a Season?, Darby, Gene; Benefic Press, '59, 48p. illus. by Lucy and John Hawkinson
4) I Like Weather, Fisher, Aileen; Crowell, '63, unp. illus. by Janina Domaneska
5) Day the Sun Danced, Hurd, Edith T.; Harper, '65, unp. illus. by Clement Hurd
6) Four Seasons in the Woods, Kane, Henry B.; Knopf, '68, 59p. illus. by the author
7) It's Time Now!, Tresselt, Alvin; Lothrop, '69, unp. illus. by Roger DuVoisin

SCIENCE EXERCISE PLANS

Incorporating Environmental Studies

ELEMENTARY SCHOOL LEVEL

Sources Consulted in Developing:

<u>A Curriculum Guide for Nature Study in the Elementary School</u>
Mrs. Marilyn Greulach
Abington School District
Abington, Pennsylvania

<u>Environmental Education: Objectives and Field Activities</u>
Paducah Public Schools
Paducah, Kentucky

Mrs. Ruth Ewalt
Little Rock Elementary School
Bourbon County Schools
Paris, Kentucky 40361

Title of Lesson: Seed Dispersal

Behavioral Objectives: After this exercise, children will:

1) Name the dispersal method of at least 4 kinds of seeds, having been shown 8 kinds previously studied
2) Bring to class one kind of seed, identify it, and state its method of dispersal

Materials Needed:

1) Plastic bags
2) Egg cartons
3) Shallow sectioned boxes
4) Chart paper (posterboard)
5) Glue
6) Hand lens
7) Several kinds of fruit and nuts (these may have to be purchased)

Activities:

1) The autumn season is the best time to carry out these activities. On or near the school grounds, have the children hunt for as many different kinds of seed cases as possible. Plastic bags should be taken along for collection purposes. Investigate thoroughly near fences where mowers can't reach.
2) At the conclusion of the nature walk, have children check their clothing for seeds.
3) When the children return to the classroom, guide them to examine their seeds with the naked eye and with hand lens.
4) Here, they should be able to do some grouping into categories such as those with wings, parachutes, pods, shells, hooks and those within a fleshy fruit.
5) Encourage the students to relate the type of structure of each seed to the way it might move.
6) Listed are some plants they may have found and the type of dispersal they have: a) parachutes: goldenrod, aster, dandelion, milkweed, b) wings: maple, ash, elm, redbud, c) hitchhikers: (carried by animals and people) burdock, sticktight, foxtail, d) shakers: poppy, e) propulsion (explain): violet, witch hazel, f) gravity (explain): cherry, oak, apple.

Follow-up Activities:

1) Charts can be made from these groups and examples of each type of seed can be displayed on the chart. The heavier seeds could be displayed in painted egg cartons or boxes that have been divided into sections.
2) Children should be asked to look individually near their homes and bring some different kinds of seed to class for study; possible identification and classification according to dispersal.
3) Mosaics can be made or partially made from seeds.
4) Cut cross-sections of apples, orange, watermelon, etc.; also vertical sections and look for patterns of seed arrangments. How might these be dispersed?
5) Let children blow some milkweed or other parachute category of seeds to show how wind can carry them long distances.

EXERCISE #1 (cont.)

6) Seeds can be stored in a dry place for possible planting later; whereby, sprouting, plant growth and parts of the plants can be observed.
7) Creative oral or written stories can be made on the childrens' discoveries. For example, "I am a seed of a violet. I was just getting ripe and full when someone reached over to touch the container in which my brothers and sisters were resting." What do you suppose happened?

Evaluation:

After this exercise has been completed, each child:
1) Named the dispersal method of at least 4 kinds of seeds having been shown 8 kinds previously studied.
2) Brought to class one kind of seed, identified it and stated its method of dispersal.

Reference Materials:

1) Seeds and How They Travel, Audubon Nature Bulletin
2) "Trees and Plants", charts, Audubon
3) "Experiments in the World of Plants", experiment
4) "Finding Out How Plants Grow", filmstrip, Society for Visual Education
5) Audubon Tree Study Program

School Library Reference Materials:

1) What's Inside of Plants, Zim, Herbert; Morrow, '53, 32p. illus. by Herschel Wartik
2) Travelers All: Story of How Plants Go Places, Webber, Irma E.; W. R. Scott, '44, illus. by the author
3) Seeds by Wind and Water, Jordan, Helena J.; Crowell, '62, illus. by Nils Hogner
4) Seeds are Wonderful, Foster, Willene K. and Queree, Pearl; Melmont, '60, 31p. illus. by Arnold Dobrin

EXERCISE #2

Title of Lesson: Adopt a Tree

Behavioral Objectives: After these activities have been concluded, each student will:

1) Give the name of the adopted tree
2) Name at least 1 change that took place during each of the 4 seasons
3) Name at least 1 animal that might use the tree as its home

Materials Needed:

1) Paper for mural
2) Paints (water) or crayons
3) Paint brushes
4) Roll of film (for taking photographs of tree by season)
5) Materials for decorating tree on some special occasion (this is for the teacher and class to choose)

EXERCISE #2 (cont.)

Activities:

1) To promote a closeness between nature and a child, observing and recording the changes a tree undergoes throughout the 4 seasons can prove a worthwhile activity.
2) Choose a pleasant day in September to take the class to the school yard for the purpose of selecting a tree they would like to adopt as their class tree for the school year.
3) Identification of the tree can be made and then the children might wish to select a personal name for their newly, adopted tree.
4) A nature walk to the tree should be taken a few times during each of the seasons. As observations are made, new information could be put on a chart. Some things to watch for are: a) when do the leaves change color?, b) when do the last leaves fall?, c) are any insects, birds or other animals living in or near the tree?, d) does the tree produce a fruit, nut or seed?, e) if there are seeds, how does the tree scatter them?, f) can you see scale rings or leaf scars?, g) does any damage occur, natural or man-made?, h) how does the tree look in winter?, i) what shape is the tree?, j) how does the bark feel? is it smooth or rough?, k) when do the spring leaves appear?, l) describe the shape of the leaves., m) does the tree bloom? if so, when?, n) what new tree neighbors or flowers have been added during the year?
5) Make a large mural drawing of the tree. As individual children see birds, insects, flowers, animals, nests or other things near on on their tree, have them draw a picture of the item and place it on the mural. The date it was observed and the child's name can be placed on a chart beside the name of the item.

Follow-up Activities:

1) Bulletin boards can be built around photographs of the tree taken in the different seasons.
2) Charts can be set up displaying a piece of bark, a seed, leaf and a twig from the tree.
3) Holidays and special days such as Halloween, Christmas, Easter, Valentine's Day and Arbor Day can be planned with the class tree in mind. The tree can be trimmed by the children in keeping with the special day.
4) Have the children draw the tree once during each season showing various changes.

Evaluation:

After these activities, each student:
1) Can give the name of the adopted tree.
2) Name at least 1 change that took place during each of the 4 seasons.
3) Name at least 1 animal that might have used the tree as its home.

Reference Materials:

1) "A Tree is a Living Thing", film
2) "Trees and Plants", chart, National Audubon Society
3) "Finding Out How Plants Grow", filmstrip, Society for Visual Education
4) Audubon Tree Study Program

School Library Reference Materials:

1) Tree Called Moses, Baker, Laura Nelson; Atheneum, '66, 92p. illus. by Ronenole Naylor

EXERCISE #2 (cont.)

2) First Book of Trees, Cormack, M. B.; Watts, '51, 93p. illus. by Helene Carter
3) Because of a Tree, Milne, Lorus J. and Milne, Marjorie; Atheneum, '63, 152p. illus. by Kenneth Gosner
4) Pine Tree, Ross, George Maxim; Dutton, '66, 38p. illus. by the author
5) Maple Tree, Selsam, Millicent E.; Morrow, '68, 46p. illus. by Jerome Wexler
6) Thanks to Trees: Story of Their Use and Conservation, Webber, Irma E.; W. R. Scott, '52, 60p. illus.
7) Trees: Guide to Familiar American Trees, Zim, Herbert and Martin, Alexander C.; '56, Golden

Free information can be obtained from Western Wood Products Association, Yeon Building, Portland, Oregon

EXERCISE #3

Title of Lesson: Wildflowers

Behavioral Objectives: At the conclusion of this exercise, students will:

1) Identify at least 4 wildflowers from 8 pictures shown
2) Use 2 words to describe each of the 4 wildflowers identified (name of colors can be used)
3) State 1 purpose a wildflower serves (beauty, to hold moisture, food for birds or prevents soil erosion)

Materials Needed:

1) Hand lens
2) Styrofoam cups
3) Soil
4) Wildflower pictures
5) Seeds
6) Posterboard

Activities:

1) A good way to introduce this lesson is by showing the filmstrip, "Wildflowers Everyone Should Know". Also, have on hand, pictures of wildflowers of our community to show the children. Pictures of our state flower (goldenrod) and state tree (tulip) should be included. Identification books are needed.
2) A good way to familiarize the children with the wildflowers in our area is to take a nature walk. In doing this, we can help the children not only appreciate the beauty of wildflowers, but to recognize their usefulness as part of nature's plan.
3) The spring season, when the wildflowers are blooming, should prove to be the best time for these observations. Perhaps permission can be granted from nearby landowners to visit fields if specimen cannot be found around school yard fences.
4) As wildflowers are spotted, have children notice the color of the flowers, pleasant smells, shape of bloom (if any) and leaves, number of leaves, size of plants and look for insects around them.
5) Discuss questions such as: a) How do these wildflowers help us?, b) What purpose do they serve?

6) The general rule is to not pick the wildflowers, but since the dandelion, foxtail, violet, pokeberry, Queen Anne's Lace (wild carrot) and a few others are so plentiful, perhaps a few specimen could be picked for closer study in the room.
7) Discuss the use of the dandelion. Who might eat the flowers, stems or leaves (man, rabbit)? Look at the whole plant. Notice the leaves form a tight circle close to the ground. How does this help the plant and the soil?
8) Try to identify each wildflower observed.

Follow-up Activities:

1) Do further research on the flowers that were not identified on the nature walk. Keep a calendar or chart to show the name of the flower identified, the date when the flower was observed, the color of the flower and the location.
2) Perhaps the children could bring in some wildflowers for transplanting in the school yard near the fence. Remind them that the surrounding soil should be taken up with the plant.
3) To see how roots anchor a plant and hold the soil, plant some seeds in styrofoam. After the seedlings have grown sufficiently, remove the seedlings and soil by gently squeezing the cup. Study the root system.

Evaluation:

1) The children can identify at least 4 wildflowers from 8 pictures shown.
2) They have used at least 2 words to describe each of the 4 wildflowers identified.
3) Stated 1 purpose a wildflower serves.

Reference Materials:

1) "Wildflowers Everyone Should Know", filmstrip
2) Pictures of wildflowers
3) Identification books

School Library Reference Materials:

1) First Book of Wildflowers, Cavanna, Betty; Watts, '61, 268p. illus. by Page Cary
2) Macmillan Wildflower Book, Hylander, Clarence J.; Macmillan, '54, 480p. illus. by Edith Farrington Johnston
3) Flowers: Guide to Familiar Wildflowers, Zimitt, S. and Martin, Alexander, C.; Golden, '50, 157p. illus.
4) Wildflowers of Kentucky, available at the Bourbon County Schools Materials Center
5) "Experiments in the World of Plants, Part I,", experiment, available at the Bourbon County Schools Materials Center
6) "Finding Out How Plants Grow", filmstrip, available at the Bourbon County Schools Materials Center

Title of Lesson: Identification of Poison Ivy

Behavioral Objectives:

At the conclusion of this exercise, and upon being given outline drawings of the leaves of 4 different plants, 80% of the students will correctly identify the drawing of poison ivy. Each student will memorize the warning, "If you 3 leaves see, let them be."

Materials Needed:

1) Overhead projector
2) Transparencies
3) Pictures of poison ivy
4) Pictures of plants resembling poison ivy
5) Chart reading, "If you 3 leaves see, let them be."
6) Outline drawings of poison ivy and similar plants

Activities:

1) Due to the fact that poison ivy can be harmful, we need to teach the children to recognize this plant in order that they can avoid it whenever possible.
2) Show the children pictures or drawings of poison ivy. Bring in leaves of the wild strawberry, Virginia Creeper and other plants that are similar. Pictures of these can be shown and compared with pictures of poison ivy.
3) The overhead projector and colored transparencies might prove to be a successful means of presenting these comparisons.
4) Illustrate the various ways the plant grows (as a vine on trees, on the ground or as an upright bush).
5) Explain that it is the oil of the plant that is poisonous to humans.
6) Take a walk to the school yard to see if the children can find any poison ivy. Look on tree trunks and fence posts.

Follow-up Activities:

1) Have this warning in the classroom, "If you 3 leaves see, let them be." Have students to memorize.
2) Have the school nurse visit the classroom to suggest ways the children can protect themselves from the rash.

Evaluation:

At the conclusion of this exercise, and upon being given outline drawings of the leaves of 4 different kinds of plants, 80% of the students can correctly identify the drawing of poison ivy. Each student can state the warning, "If you 3 leaves see, let them be."

Reference Materials:

1) Pictures of poison ivy
2) Pictures of plants whose leaves resemble the leaves of poison ivy
3) Encyclopedias
4) "Plants that Poison", poster, Geigy Agricultural Chemicals, Division of CIBA, Geigy Corporation, Saw Mill Road, Ardsley, New York

5) Free materials can be obtained from the National Safety Council, School and College Department, 425 N. Michigan Avenue, Chicago, Illinois
6) Materials can be obtained from the U. S. Department of Agriculture, Soil Conservation Service, Washington, D. C.
7) Materials may also be obtained from the County Agent

EXERCISE #5

Title of Lesson: Animal Homes

Behavioral Objectives: At the conclusion of this exercise, each student will:

1) Identify at least 4 animal homes
2) Use at least 2 words to describe each home identified
3) Name 1 place where an animal home may be found (tree, ground, fence, etc.)

Materials Needed:

1) White or black spray paint
2) White or black construction paper
3) Jars with perforated lids to house cocoon, chrysalis or caterpillar
4) Insect cages
5) Scissors

Activities:

1) A good way to introduce a lesson on animal homes is be viewing the filmstrip, "Rings, the Raccoon". This is a story of a raccoon, her home, her babies and her activities. Another good introductory filmstrip for this lesson is "The World of Living Things". This filmstrip tells the kinds of homes living things have. Both are available at the Bourbon County Schools Materials Center.
2) Fall is a good time to begin a study of animal homes. On a nature walk during this season, children can not only observe, but may have the opportunity of collecting a few specimen of abandoned homes such as bird nests, wasp nests or cocoons. These can be taken to the classroom for closer observations. Then, in the spring, perhaps another nature walk can be taken enabling the children to observe homes being built in preparation for raising families.
3) On this autumn nature walk, which could be in or near the school yard, special attention should be given as to where the homes are found (in trees or bushes, on or in the ground, fastened to building and fences, etc.).
4) Look for ant hills. Food such as bread or cake crumbs could be scattered nearby to encourage activity.
5) Look for earthworms and insects under logs, boards and rocks or in other moist places.
6) Check trees and bushes for bird nests, cocoons of moths, a butterfly chrysalis or perhaps a spider web. There may be a hole in the trunk where a squirrel is hiding. Remember, too, some birds build nests on the ground.
7) Check sides of buildings for wasp and mud dauber nests.
8) Identify the animals that make use of each home observed.

9) If a cocoon or chrysalis is taken back to the classroom, be sure it is left attached to the twig on which it was found. If a caterpillar is taken, also take some leaves from the plant it was taken from. This is the food it will need to stay alive.
10) Be sure that proper containers have been made available for the specimen taken back to the classroom. Caterpillars, cocoons and chrysales can be placed in large glass jars with perforated lids. There should be a small container of water or wet cotton kept in the jar. The caterpillar will need to be fed leaves from the plant on which it was found. With proper care, he may spin a home for you. Later, he may emerge as a beautiful butterfly or moth. Then, when strong enough, he should be taken outdoors to live a free life.

Follow-up Activities:

1) Back in the classroom, bird nests and other homes may be studied more fully. They may be taken apart to find out from what materials they are made and how they were designed.
2) If a spider web can be found, an interesting activity is to make a web print. To make a spider web print, you will need to know first that the spider is not in sight. If he is, a twig can gently prod him to cover as we do not wish to harm the spider. Why? To start the print, you will need white or black spray paint, white or black construction paper (use the color which will constrast with the color of the paint) and scissors. From a side angle, the web should be sprayed sparingly, coating both sides. When this is done, ease the paper up to the web and then carefully clip the guide lines of the web with the scissors. The print should be set on a flat surface to dry. It can be sprayed with plastic spray to protect it for a permanent collection.
3) Also, as a follow-up activity, the children should have the opportunity of observing animals in the spring. Then, they may see the animals actually building the kinds of homes they investigated in the fall. There are 2 filmstrips available at the Bourbon County Schools Materials Center that should be shown at this time: "Mr. and Mrs. Robin and Their Springtime Family" and "Mrs. Cottontail and Her Springtime Family".

Evaluation:

After concluding this exercise, each student:
1) Can identify at least 4 animal homes
2) Can use at least 2 words to describe the animal homes identified
3) Can name 1 place where an animal home could be found

Reference Materials:

1) "Charlotte's Web", story by E. B. White
2) Pictures of animals' homes that are available
3) "Rings, the Raccoon", filmstrip
4) "The World of Living Things", filmstrip
5) "Mr. and Mrs. Robin and Their Springtime Family", filmstrip
6) "Mrs. Cottontail and Her Springtime Family", filmstrip
7) "Life Cycle of the Monarch Butterfly", filmstrip
8) "Finding Out How Animals Live", filmstrip

School Library Reference Materials:

1) Winter-Sleeping Wildlife, Barker, Will; Harper, '58, 136p. illus. by Carl Burger
2) Wonders of the Fields and Ponds at Night, Berrill, Jacquelyn; Dodd, '62, 80p. illus. by the author
3) Wonders of the Woods and Desert at Night, Berrill, Jacquelyn; Dodd, '63, 78p. illus. by the author
4) Who Lives in this House?: Story of Animal Families, Blough, Glenn O.; McGraw, '57, 48p. illus. by Jeanne Bendick
5) Who Lives in this Meadow?: Story of Animal Life, Blough, Glenn O.; McGraw, '61, 47p. illus. by Jeanne Bendick
6) Where They Go in Winter, Buck, Margaret Waring; Abingdon, '68, 72p. illus. by the author
7) When Winter Comes, Fox, Charles P.; Reilly, '62, 29p. illus. by the author
8) Wonders of Animal Architecture, Lavine, Sigmund A.; Dodd, '64, 63p. illus. by Margaret Cosgrove
9) Animal Homes, Mason, George F.; Morrow, '47, 96p. illus.

EXERCISE #6

Title of Lesson: Bird Nests

Behavioral Objectives: At the conclusion of these investigations, each student will:

1) Name 5 items that birds use as nesting material
2) State where the birds may have found these materials used

Materials Needed:

1) Copy of rhyme, "The Egg in the Nest"
2) Posterboard
3) Bits of yarn, string, moss, twigs, paper, cloth, feathers, grass, straw (these are for nesting materials for the birds)

Activities:

1) Autumn is a good time to take a nature walk for the purpose of observing bird nests. Most bird nests have been abandoned by this time and, by careful study of these nests, children can foster an appreciation for the creativity of a bird's habits and instincts. Also, by observing the variety in nests and nesting materials, they can recognize the dependence of living things upon their environment.
2) If some nests are found, they should be observed for several days to be certain thay have abandoned. Note the placement of nests (forks of trees, climbing vines, hollow trees, hanging from branches).
3) 2 or 3 abandoned nests could be taken back to the classroom for comparison. If taken apart, children may be surprised to find such a large variety of items used for building materials. There might be such materials as twigs, dry leaves, hair, strings, moss, tinfoil and flower petals. Have the children place like items together in piles or small containers.

4) Questions to ask might include: a) Why do you suppose these particular items were used?, b) Can you identify all these materials?, c) What shape is the nest?, d) What bird might have built this type of nest?, e) Where did the bird get these materials?, f) How many separate flights do you think it took to gather all these materials?, g) Was mud used in building the nest?

Follow-up Activities:

1) Just before spring-nesting time, the children can help supply building materials for new nests by placing a box near trees or bird feeders on the grounds near the school. The box should contain bits of yarn, grass, moss, feathers, strings, straw and thin strips of paper or cloth. None of the items should be more than 6 inches in length.
2) During the nesting period, a check could be made of the supply box to see if the birds are using any of the items. It would be interesting to learn what types of things they like most.
3) If an active bird's nest can be located at this time, a long-term observation could be a rewarding experience. Look for these things: a) Can you tell what materials were used in making the nest?, b) How do the father and mother birds protect their nest?, c) Note the size, shape, coloring, bill, song, flight and habitat of the birds., d) Note the less colorful female. How is this one of nature's protective devices?, e) Who searches for the food for the babies?, f) Can you find out what kinds of food the babies are eating? The nest must not be disturbed or touched as the parents may abandon the nest.
4) An experience chart may be kept by the children whereby they can record the things they have seen.
5) Use the nursery rhyme, "The Egg in the Nest" for a choral reading. It is in Together we Speak by Helen Evans.

Evaluation:

At the conclusion of this exercise, each student:
1) Can name 5 items that birds use as nesting materials.
2) Can state where the birds may have found each of these items named.

Reference Materials:

1) Audubon Bird Study Program, kit, available at the Bourbon County Schools Materials Center
2) "Birds and Other Animals", National Audubon Society chart, available at the Bourbon County Schools Materials Center
3) "Mr. and Mrs. Robin and Their Springtime Family", filmstrip

School Library Reference Materials:

1) Bird is Born, Bosinger, E. and Guilcher, J. M.; Sterling, '60, 92p. illus. by E. Hoskins and R. H. Noailles
2) Birds and Their Nests, Earle, Olive L.; Morrow, '52, 60p. illus.
3) It's Nesting Time, Gans, Roma; Crowell, '64, illus. by Kazue Mizumura
4) Birds in Their Homes, Webb, Addison; Garden City, '47, 66p. illus. by Sabra Mallett Kimball

SPECIAL EDUCATION EXERCISE PLANS

Incorporating Environmental Studies

Sources Consulted in Developing:

Teacher's Curriculum Guide to Conservation Education
Matthew J. Brennan
J. G. Ferguson Publishing Company
Chicago, Illinois

Agriculture Resources Unit (Module): Community Pollution
Developed by Wilson G. Collins
University of Kentucky
Lexington, Kentucky

Compiled by:

Miss Sue Gilvin
Special Education Teacher
Clintonville Elementary School
Bourbon County Schools
Paris, Kentucky 40361

EXERCISE #1

Title of Lesson: Social Behavior: Anti-Littering Campaign

Behavioral Objectives: Completion of this exercise will enable the child to:

1) Develop an awareness of what littering is and it's connection with environmental pollution
2) Grow in ability to accept responsibility for the environment
3) Control litter through personal action
4) Develop daily habits that will keep our world an attractive place to live in
5) Realize that litter is a problem which people can prevent

Materials Needed:

1) Oil cloth
2) Heavy paper
3) Tempera paint
4) Magic markers
5) Yarn
6) White contact paper
7) Camera and color film
8) 55 gallon oil barrel
9) Paint
10) Paste or glue
11) Poster paper
12) Chart paper
13) Garbage bags
14) Paint brushes
15) Scissors
16) Coffee cans for paint

Activities:

1) Prepare before class a mask from a big paper bag. Dramatize being a litterbug by wearing the mask and throwing trash over the room. Ask questions: a) What am I?, b) What does a litterbug do?, c) Are you a litterbug?, d) Have you ever seen a litterbug?
2) Take the class for a walk around the school, community, etc. This is a "look-study" period. Enforce silence and reserve comments for the return to the room.
3) Discuss the hazards posed by the problem of littering. Examples: fire and health.
4) Make a chart as the children name different things that represent litter (paper, banana peels, candy wrappers, sticks, toys, cans, bottles, etc.).
5) Write a story about a paper napkin that went to a picnic.
6) Make a chart of the "do's and don'ts" for keeping a clean school, home and community.
7) Have a clean-up time for the classroom, school and school grounds. a) See how much litter can be found in one area of the playground., b) Have a contest, boys versus girls, to see which team can collect the largest pile of litter., c) Count the number of trash receptacles the students find. Are they well marked and easily located for use? If not, let the students paint and mark them., d) Take before and after pictures for a scrapbook, or to publish in the local paper.

EXERCISE #1 (cont.)

Follow-up Activities:

1) Use teacher and student made bulletin boards in the classroom and available areas throughout the school.
2) Have the students make and display posters throughout the community.
3) Clean and paint a large oil barrel for the school and/or community.
4) Make litterbags for cars, bicycles and school desks. Directions for making litterbags: litterbags can be made from fabric, plastic, oil cloth or heavy paper. For each bag, cut 2 pieces: 1 6"x8" (front) and 1 6"x10" (back). Curve the top of the back piece and cut a slit for hanging it over a knob. Seam the 2 pieces together with yarn.
5) Make bumper stickers and badges out of white contact paper and magic markers.
6) Have the children plan a skit and develop a school-wide anti-litter campaign: a) Have students visit each class and present their skit and anti-litter campaign., b) Students in the school who wish to do so will sign an anti-litter pledge to "Reconsider Before You Litter". (We the students of _____School of_____,_____ pledge "I will not....."., c) Distribute the anti-litter badges to students who participate in the above activity.
7) Play the "Litterbug Game". Directions for the game: the children form a circle and choose 2 people to play the parts of a litterbug and a neaterbug. Sing the jingle to the tune of "Did You Ever See a Lassie":
"Oh here comes a litterbug, a litterbug, a litterbug,
Oh here comes a litterbug
Just see what he'll do.

I don't want to be a litterbug, a litterbug, a litterbug
I don't want to be a litterbug
And neither do you.

Oh I want to be a neaterbug, a neaterbug, a neaterbug
Oh I want to be a neaterbug
And so do you."
8) Make a symbolic "litter monster" out of the litter that the children collect in the school yard. He will serve as a reminder of the anti-litter campaign and encourage others to join in the project.

Evaluation:

1) The child knows what litter is and helps control littering through his personal actions.
2) The child exhibits changes in his habits and attitudes in realizing his responsibilities toward his environment.
3) The child can define litter and types of litter.
4) The child knows do's and don'ts important in helping solve the problem of litter pollution.
5) The child encourages other people to help prevent litter.

Reference Materials:

1) "Lassie's Litter Bit", film, color, 28 min., available at the Bourbon County Schools Materials Center
2) "Litterbug", film, color, 8 min., Walt Disney, available at the Audio Visual Services, University of Kentucky, Lexington, Kentucky
3) "Telling the Anti-litter Story in Home, School and Community through

EXERCISE #1 (cont.)

the Use of Classroom Bulletin Boards", free materials, Standard Oil Company of California, Public Relations Department, 225 Bush Street, San Francisco, California, 94120

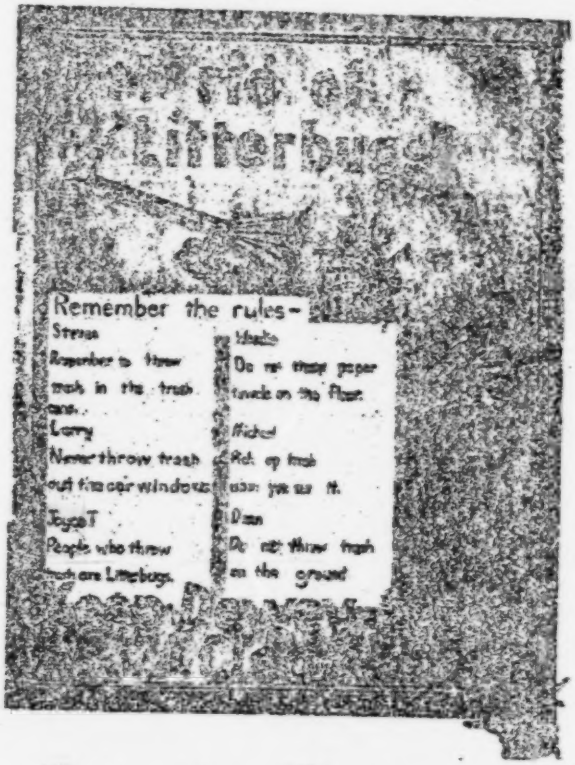
4) "KAB Reports", pamphlet, Keep America Beautiful, Inc., 99 Park Avenue, New York, New York, 10016, Summer, 1970
5) "Ebid", Summer, 1969, pamphlet
6) "Dan'l Boone Swept Here", pamphlet, Kentucky Clean-up and Beautification Program, Kentucky State Department of Natural Resources

Litterbag Mask

Trash Barrel
(55 gallon oil can)

Litterbag
(fabric, plastic, oil cloth)

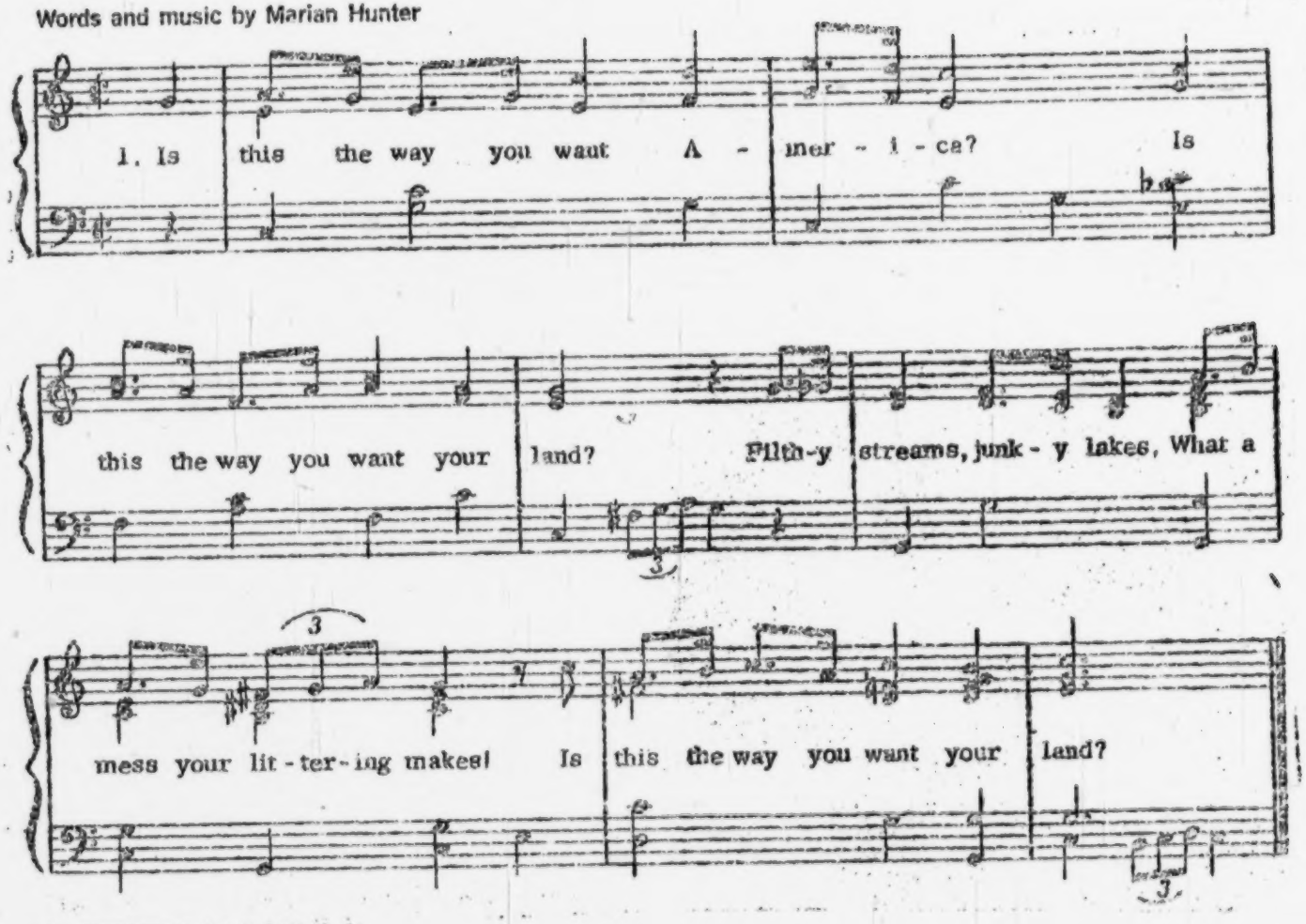
Instructor, November, 1970



Bullentin Board

Is this the way?

Words and music by Marian Hunter


1. Is this the way you want A - mer - i - ca? Is
this the way you want your land? Filth-y streams, junk - y lakes, What a
mess your lit - ter - ing makes! Is this the way you want your land?

2. Is this the way you want Colorado?
Is this the way you want your state?
Littered roadsides, trash-filled parks,
Disrespect for old landmarks,
Is this the way you want your state?

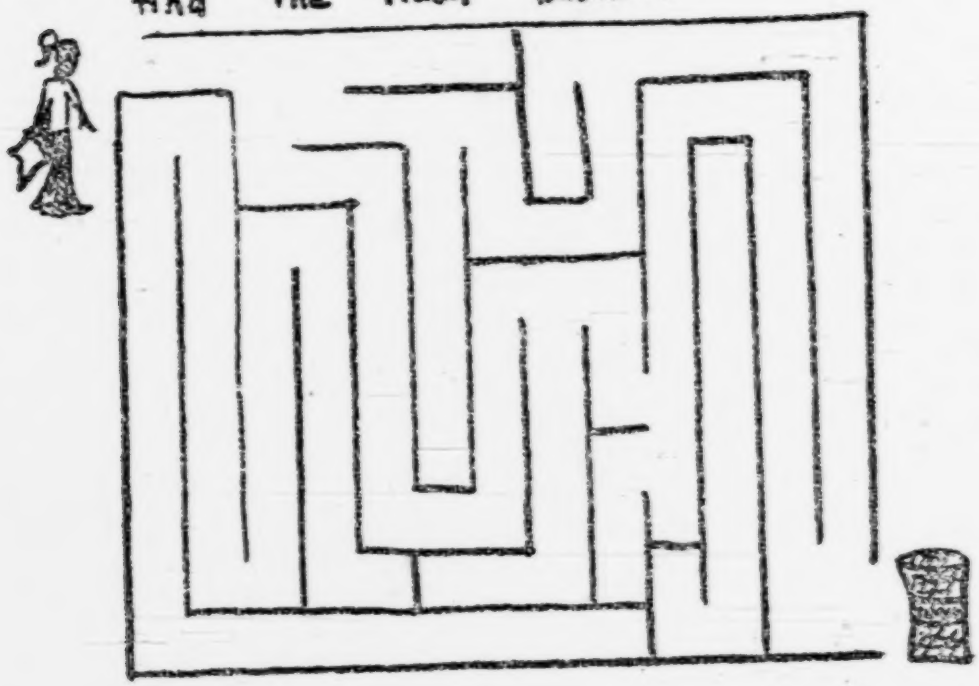
3. Is this the way you want Otero County?
Is this the way you want your land?
Ugly eyesores everywhere,
Bottles and cans, or don't you care?
Is this the way you want your land?

(cont.)

4. Is this the way you want La Junta?
Is this the way you want your town?
Crumbling buildings, trashy slums,
Paint a picture mighty glum.
Is this the way you want your town?

Change the state, county, and town to your own.

Draw a line to help Mary Lou find the trash basket.



Game

What is John saying?

EXERCISE #2

Title of Lesson: Appreciation of Our Environment Through Our Senses

Purpose: To develop the child's skills in thinking, seeing and doing so that the child will become more sensitive to his environment by:

1) Observing the total environment through his senses
2) Becoming aware of the beauty, serenity and mystery involved throughout our different environments
3) Observing through the major senses what is pleasant and what is unpleasant in nature
4) Learning to protect the beauties which they are able to hear, smell, see and feel

PART I: To See

Behavioral Objectives:

1) Students will recognize the many different colors, shapes, shades and sizes in nature
2) Each student will observe things in nature at distances (near, far and close)
3) Each student will observe things in nature at different heights (eye level, up, down, tiptoe, lying on the ground, etc.)
4) Students will discover things that nature has hidden
5) Students will determine what things are pleasant to see and what things are unpleasant to see
6) Students will learn that each person may see different things and may see things differently

Materials Needed:

1) Chart paper
2) Tempera
3) Paper
4) Slide and film projector
5) Construction paper

Activities:

1) Have the class go to a designated area and have a silent "look and see" time. After observations are made do the following: a) Have each student tell about something that he saw and had never noticed before., b) Some students may want to point out things that they see and others do not.
2) Have the students observe at different heights and ask questions such as: a) What do you see when you are standing? How far can you see? Is everything still? What colors can you see? etc., b) What do you see when you look up very high? Are there clouds? What shapes are the clouds? Do you see leaves falling? Ashes? Are you looking through branches? etc., c) What do you see when you look toward the ground? Footprints? Litter? Pebbles? Grass? Soil? Insects? etc., d) Lie down on the ground. How far can you see? What colors do you see? What do you see just in front of you? etc.
3) Have the students observe objects from different distances.

4) In the classroom, make reading charts of things that the students observed and of new concepts developed: a) things that are pleasant and things that are unpleasant to see, b) list of colors, shapes, animals, etc. observed by the children, c) list of man-made natural objects observed.
5) Discuss experiences that take place outdoors that cannot be enjoyed anywhere else.
6) Discuss the beauty of nature and different ways that this beauty can be expressed: a) poetry, b) painting, c) music, d) books, e) photography (slides, movies, etc.).

Follow-up Activities:

1) Take the students outside for an art lesson. Have them paint landscapes using natural colors. This may be a good time to introduce the primary colors.
2) Use activities, games, lessons to help the students in developing 3-dimensional visual discrimination skills.
3) Play games with the children such as "On the Way to School I Saw".
4) Discuss what the community might have looked like before it was inhabited by man.
5) Discuss ways that the students can help keep the environment beautiful and how they can help make their immediate surroundings more attractive.
6) Show slides and films to the students.
7) Make a scrapbook and/or bulletin board of pleasant and unpleasant things to see in our environment.
8) Have the students bring in pictures of their favorite scenes for display on the bulletin board.

Evaluation:

1) Observation of student's participation.
2) The student is able to recognize different colors, shapes, shades and sizes from nature.
3) The student is aware of how things look at different distances with relationship to size.
4) The student can express his feelings toward pleasant and unpleasant sights to see in nature.

PART II: To Feel

Behavioral Objectives:

1) Each student will feel the different kinds of textures in the environment (tree, bark, stone, pebbles)
2) Students will learn to distinguish different kinds of texture (smooth, rough, glazed, sticky, etc.)
3) Students will feel sharp and dull objects (thorns, stumps, twigs, pebbles, etc.)
4) Students will compare different shapes and textures in nature
5) Students will learn what some things in nature are alive and some things that are dead
6) Students will notice the changes in the air when it is still, hot, cold, wet, sticky, etc.

EXERCISE #2 (cont.)

Materials Needed:

1) Texture samples
2) Mud
3) Soil
4) Clay
5) Gravel
6) Wooden block box
7) Mounting texture samples
8) Glue
9) Pebbles
10) Pine cones
11) Seashells
12) Bark
13) Tempera
14) Spray plastic coat
15) 20 small stones for each student
16) Cardboard or cork squares

Activities:

1) Introduce the children to different texture in the classroom: a) Blindfold the children and have them identify different textures (rough, smooth, hard, soft)., b) Mount different textures on wooden squares and place them in a box. Let the children reach in the box and tell what texture they have chosen.
2) Take the children outside to identify the different texture in their environment. Let the children collect small bits of different textures that they can find (bark, pebbles, weeds, grass, acorns, nuts, etc.).
3) Bring in soil, mud, sand, clay and gravel: a) Let the children experience the feel of the different samples., b) Add water to the different samples and see what happens (why does the mud stick together? why doesn't the sand stick together?).
4) Make a vocabulary list of new words that have been introduced in the unit (sharp, dull, rough, smooth, texture, etc.).
5) Make a nature collage of the collection that the children made on their outdoor visit.

Follow-up Activities:

1) Mosaics can be made out of pebbles, seashells, bark, pinecones, etc.
2) Have the children make clay bowls and models.
3) The children can make a paperweight out of stones. Directions: find 15 or 20 small stones. Glue one of the larger stones to the center of a piece of cork or cardboard (about as big as your hand). Glue the other stones in a circle around the center stone. More than one circle may be made. Paint each stone. When the paint dries, shellac each stone. Cut away the stone or cork that sticks out beyond the base.

Evaluation:

1) The student can detect and describe different textures found in nature.
2) The students can determine what things in nature are alive and what things are dead.
3) The students can distinguish between sharp and dull objects.

EXERCISE #2 (cont.)

PART III: To Hear

Behavioral Objectives:

1) Each student will learn to listen to loud and soft sounds in nature
2) Each student will listen to pleasant and unpleasant sounds in nature
3) Students will identify different sounds in nature
4) Students will identify the difference between natural and mechanical (man-made) sounds
5) Students will be able to identify distant and close up sounds and sounds at different heights and levels
6) Students will listen to and identify such different sounds as calling, warning, hungry, happy and talking. Sounds while sitting, standing, kneeling, etc. on a hill, in a cave, behind a tree and under a blanket
7) Students will compare inside sounds with outside sounds
8) Each student will identify some sounds with what makes them: tree, wind, rain, bird, insect, animal, machine, etc.

Materials Needed:

1) Record player
2) Tape recorder and tapes
3) Coffee cans
4) Old intertubes
5) Wooden blocks
6) Sand paper
7) Used light bulbs
8) Newspaper
9) Wheat paste
10) Lid (oat box)
11) Bottle caps
12) Melodic bells

Activities:

1) Have the students close their eyes and listen for sounds. Make a list of sounds that they hear on the chalkboard: a) Make different sounds while the students close their eyes and ask them to identify the sounds., b) Use different objects to make sounds., c) Make tape recordings of different sounds for the students to identify.
2) Take the class outside for a listening period. Remember to enforce silence for this experience: a) Distinguish between the sounds of nature and man-made sounds., b) Distinguish between pleasant and unpleasant sounds., c) Let the students mimic different sounds., d) Let the students make sounds from different distances, heights, and places. Record the sounds and play back so that the students may know the difference.
3) Make tape recordings of different sounds. Have the students make a chart of the sounds as they listen to them.

What made the sound?	Where would you hear this sound?	Was it loud or soft?

4) Play records that will help the students in listening activities and with the identification of different sounds:
   a) Ear Training for Middle Grades
   b) Songbirds of America in Color, Sound and Story
   c) The Bird World of Song
   d) Noisy and Quiet: Big and Little
   e) Listen: There are Sounds Around You
5) Discuss noise pollution (too much noise): a) What noises bother people?, b) What noises bother animals?, c) Can too much noise be harmful?
7) Discuss the different kinds of sounds: a) sounds that are pleasant to hear, b) sounds that help people, c) sounds that are too noisy . Make recordings of the sounds discussed. Have the students identify and chart the sounds in the following manner:

What made the Sound?	Man-made or Natural?	Pleasant or Unpleasant?	Does it Help People? How?	Was it too Noisy?

8) Let the children bring in a list of sources of sounds they find at home.

Follow-up Activities:

1) Play nature recordings and have the students draw pictures of what he hears.
2) Let the children use their bodies to express their feelings as they listen to "Thunderstorm" from the Grand Canyon Suite and "On the Trail" from the same record.
3) Let the students make different musical instruments and experiment with sound. Musical instruments such as the following may be made: a) drums: use a coffee can and an old intertube, b) sticks: find straight sticks, peel, sand and polish them, c) maracas: use an old light bulb and cover with paper mache; paint and decorate and preserve with a coat of clear, plastic spray, d) sand blocks: glue pieces of sand paper on 2 wooden blocks; tack leather straps on the blocks, e) tambourine: use a lid from Quaker Oats box and soft drink bottle caps.
4) Teach the students to play melodic bells.
5) Use poetry that contains interesting "sound" words (example may be found in Childcraft, Vol. I, pp. 116, 117, 100, 99, 95 and 98).

Evaluation:

1) The student can discriminate between different sounds in nature.
2) The students can determine what sounds are pleasant and what sounds are unpleasant.
3) The students will distinguish between natural and man-made objects.
4) The students will identify different sounds.

PART IV: To Smell

Behavioral Objectives:

1) Each student will learn to identify different smells in nature

EXERCISE #2 (cont.)

(sweet, sour, fresh, musky)
2) Each student will identify pleasant and unpleasant odors in nature
3) Each student will become aware of potential dangers in using their sense of smell (paints, smoke, pollen, dust, insects)
4) Each student will smell different soils and water
5) Each student will identify different things that make odors in nature (plants, soil, fish, water, birds, animals, etc.)

Materials Needed:

1) Containers (cottage cheese cartons, plastic bags)
2) Chart paper
3) Odor samples (spray paint, glue, ammonia, gasoline, etc.)
4) Drawing paper
5) Crayons
6) Containers to burn sample in
7) Bits of wood, rubber, plaster, feathers, etc. to burn

Activities:

1) Introduce the unit by spraying a pleasant and then an unpleasant odor about the classroom: a) Make a chart of pleasant and unpleasant odors that the students can think of immediately., b) Leave space on the chart for new odors that they discover during the study.
2) Furnish the students with containers (plastic bags, cottage cheese cartons, etc.) so that they may collect different samples of odors from their environment for the science table (flowers, hay, pond water, wet leaves, fresh cut wood, rotting apples, onions, mud, etc.): a) have the students label their collection., b) Have the students classify the odors (pleasant and unpleasant). Some students may enjoy odors that others do not., c) Blindfold the students and let them identify the different odors of the collection.
3) Bring samples of odors that are dangerous to class and let the students become familiar with them (plant vapors, smoke, glue, gasoline, sewage, etc.).
4) Let the students add the new odors that they have learned to the chart that they began in first activity.
5) Talk about different odors in different seasons and reinforce this as the seasons approach.
6) Discuss pleasant and unpleasant body odors and ways to maintain a pleasant body odor (display soap, deoderant, powders, toothpaste, etc.).

Follow-up Activities:

1) Draw the noses of different animals (rabbit, deer, snake, fish, bird, snake, insect, etc.).
2) Draw pictures of things that have pleasant and unpleasant odors (flower, skunk, foods, etc.).
3) Burn different samples so that students may experience and identify different odors that may represent danger (wood, rubber, plastic, feathers, sulfur).
4) Read poems about the sense of smell (Childcraft, Vol. I, p. 150).

Evaluation:

1) The student can identify different odors in nature.
2) The student can identify pleasant and unpleasant odors in nature.
3) The student can identify certain odors with potential dangers.

EXERCISE #2 (cont.)

4) The student can identify different sources of odors in nature.

PART V: To Taste

Behavioral Objectives:

1) Each student will know that there are rules to abide by in "picking" nature's edibles (dangers)
2) Each student will taste sweet and sour tastes in nature
3) Each student will taste pleasant and unpleasant items in nature
4) Each student will taste different leaves, roots, stems, shoots and bark in nature
5) Each student will recognize some edible plants
6) Each student will develop an awareness of the relationship between smell and taste
7) Each student will taste vegetables from different sources and observe the differences in taste (fresh, hothouse, canned, frozen)
8) Each student will be aware that many vegetables, fruits, water and animal life are polluted by man

Materials Needed:

1) Vegetables
2) Fruits
3) Cooking utensils
4) Hot plates
5) Chart paper
6) Wild meats
7) Newspaper
8) Wheat paste
9) Tempera
10) Brushes
11) Spices
12) Magazines

Activities:

1) Bring in bark, leaves, roots, stems, etc. from nature that the students may taste.
2) Collect and cook dishes from nature, gardens, etc.: a) root: carrot, beet, potato, parsnip, turnip, b) stem: rhubarb, asparagus, hickory shoots, milk weed shoots, c) leaf: onion (underground), lettuce, spinach, brussel sprouts, cabbage, kale, dandelion, watercress, mustard, parsley, d) flower: broccoli, cauliflower, e) seed: bean, pea, corn, okra, f) fruit: tomato, apple, pumpkins, egg plant, melons, berries, grapes, papaw, persimmon, g) sap: maple, boxelder, walnut, hickories, birches, h) birds: partridge, pheasant, quail, i) tea: sumac, coffeetree, sassafras, basswood, j) spices: cinnamon, clove, nutmeg, k) herbs: chives, parsley, eill, l) sweet: berries, melons, m) sour: berries, lemons, grapefruit, n) salt: ocean, grass, o) have the students make individual charts of their likes and dislikes, p) make sure that all students taste things that they have not tasted before, q) have the students hold their noses and taste different foods (an onion and an apple), r) blindfold the children and see if they can identify a cola, 7-up and gingerale.

EXERCISE #2 (cont.)

3) Identify plants (fruits, etc.) that are poisonous if eaten. Make a bulletin board using pictures of such plants.
4) Prepare different animals for the students to taste (rabbit, fish, dove, squirrel, duck, etc.).

Follow-up Activities:

1) Make paper mache models of mushroom, vegetables, berries, etc.
2) Let the students write invitations and invite different school personnel to their tasting party.
3) Find out the different uses of plants such as flavorings, medicines, dyes, etc.)
4) Make a window garden in the classroom.
5) Make an African market stall by placing 4 sticks or branches in buckets filled with sand or rocks. Add a straw-covered roof. Place real fruits and vegetables on a low table for the children to sample.
6) List different types of foods and discover how many ways they can be served.
7) Discuss the different things that different animals and insects eat.
8) Make a food tree to display the paper mache projects.

Evaluation:

1) The student can distinguish nature edibles that are safe to eat and those that are dangerous.
2) The students will sample foods from nature that they have never had.
3) The students will distinguish between sweet and sour types.
4) The students will understand that there is a relationship between taste and smell.

PART VI: Review of the Five Senses

Behavioral Objectives:

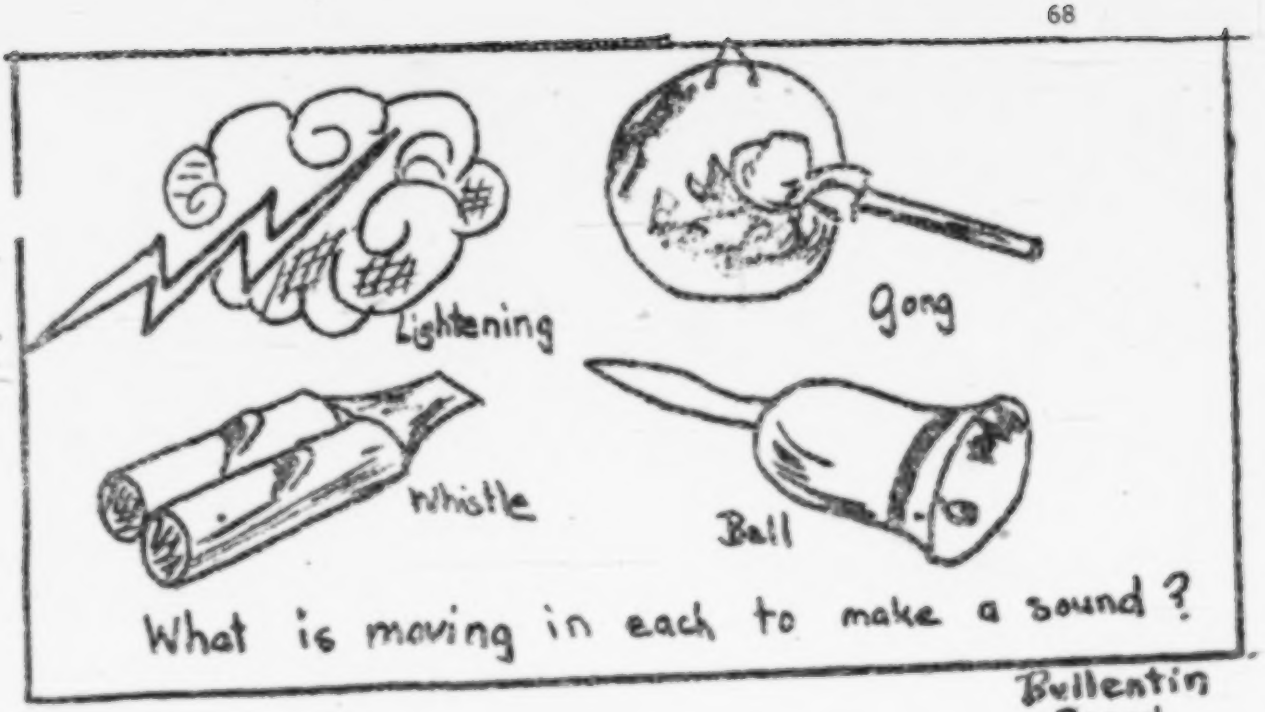
1) Each student will carry out the objectives of the previous 5 parts
2) Reinforcement will be made where weaknesses in understanding are observed
3) Each student will use the 5 senses in describing things in nature
4) Each student will recognize the importance of their 5 senses in reference to their responsibility in helping the environment survive
5) Each student will note how wildlife depends on their 5 senses
6) Each student will recognize the importance of their 5 senses in relationship to appreciation of the environment
7) Each student will become more sensitive to his environment through the use of the 5 senses

Materials Needed:

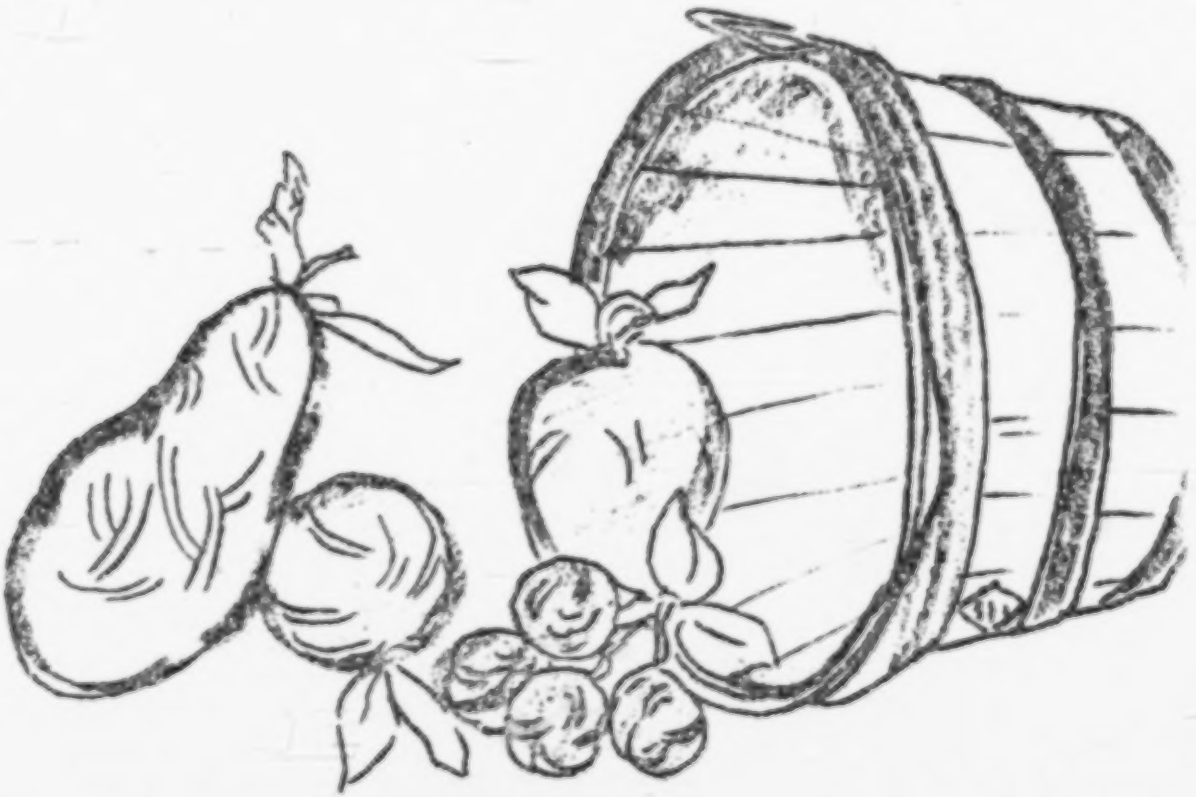
Materials used through the first 5 parts of the study

Activities:

1) Have the students make a scrapbook with information they have learned throughout the unit (copies of charts, new words, concepts, pictures collected, etc.).

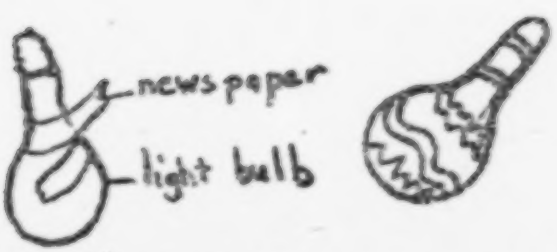


Bulletin Board

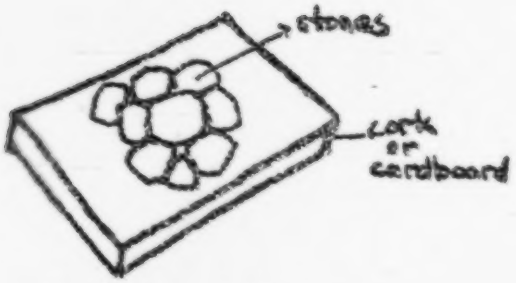


Fruits and Vegetables
(ballons covered with yarn dipped in plaster)

Tamborine

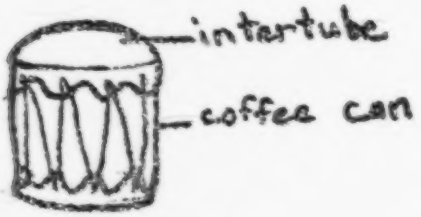


Maracas
(break the light bulb for sound)

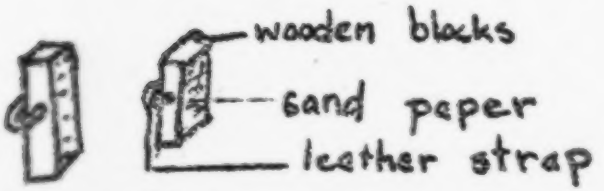


Paper weight

Musical Instruments



Drum



Sand blocks

EXERCISE #2 (cont.)

2) Let the students write poetry about how they use their 5 senses for their scrapbook.
3) Reading poems about the senses and making copies for their scrapbook (Childcraft, Vol. 14, pp. 75-91).
4) Have the students list ways that they use their 5 senses to live and survive.
5) Look up and discuss and also observe ways that animals use their 5 senses.
6) Discuss ways to take care of our senses.

Follow-up Activities:

Emphasize the use of the 5 senses throughout the 4 seasonal changes. This might be done through the use of a bulletin board that is changed as the seasons change.

Evaluation:

1) The students can recognize the importance of their 5 senses in relationship to the environment.
2) The students can determine ways that wildlife uses its 5 senses.
3) The students will determine pleasant and unpleasant things in nature through the use of their 5 senses.
4) The students are interested in protecting the beauty that they can see, hear and feel.
5) The student is aware of the beauty, serenity and mystery involved throughout our different environments.

Reference Materials:

1) Curriculum Guides
2) Observing Our Environment Through Our Senses: A Teacher's Guide, Staskey, Paul (Dr.), Davenport, Iowa, 52802
3) Teacher's Curriculum Guide to Conservation Education, edited by Brennan, Matthew J., Pinchot Institute, 1969, available at the Bourbon County Schools Materials Center
4) "Ear Training for Middle Grades", record
5) "Songbirds of America in Color, Sound and Story", record
6) "The Bird World of Song", record
7) "Noisy and Quiet: Big and Little", record
(Records may be obtained from the University of Kentucky, Regional Special Education Instructional Materials Center, Lexington, Kentucky.)
8) "Listen: There are Sounds Around You", record and filmstrips, University of Kentucky, Regional Special Education Instructional Materials Center, Lexington, Kentucky
9) "Sound and How it Travels", film, 11 min., color
10) "Hear Better: Healthy Ears", film, 11 min., color
11) "The Wonderful World of Seasonings", free materials, Advertising Department, 1 Mustard Street, Rochester, New York, 14609
12) "Chocolate: America's Favorite Flavor", free materials, Chocolate Information Council, 777 Third Avenue, New York, New York, 10017
13) Childcraft: The How and Why Library, Vol. I, II and XIV, 1972 edition, Field Enterprises Corporation